Universal Husbandry IMPROVED,

OR, DIVERS

RARE and CHOICE

EXPERIMENTS

AND

SECRETS

Relating to all Kind of Husbandry
GARDNING & PLANTING.

With divers Rarities of *Gabriel Platt* & others,
both Forreign and Domestick.

Now Divulged for the Enrichment of the Kingdom of *England*.

The Heads of the Particulars are contained in
the seven next Leafes.

By that Laborious Improver and Refiner of our
English Husbandry

Mr. SAMUEL HARTLIB.

LONDON,

Printed for *R. H.* and are to be Sold in St. *Pauls* Church-yard.

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A Bank of Lands, or an Improvement of Lands never thought on in former Ages. Begun to be preſented upon moſt rational and demonſtrable grounds by Mr. William Potter *(a Gentleman of great deſarts, and of a moſt publique ſpirit) which being more fully cleared in all its particulars, and eſtabliſhed by publique Authority may become a ſtanding and ſettled means to enrich the whole Nation, and alſo to remove Taxes, and other publique Burdens*; from p.289. &c.

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An

AN INTRODUCTION
TO THE
LEGACY of *HUSBANDRY*
Extracted out of the Surveyors Dialogue, *page* 223.

HE that will have profit must use the Means, they must not sit, and give aim, and wish, and repine at other increase: There must be Observation to mark how others thrive, Inclination and Imitation to do the like by endeavour and charge; and if one Experiment fail, try a second, a third, and many: Look into Places and persons, note the Qualities of the Lands of other men, and compare it with your own, and where there is a resemblance; mark what the best Husband doth upon his land, like un-

unto thine, if it proſper, practiſe it, and follow the example of him that is commonly reputed a thrifty underſtanding Husbandman. And by this means will Experience grow, and of one Principle of Reaſon, many Concluſions will proceed.

And again.

We have indeed a kind of plodding and common courſe of Husbandry, and a kind of peeviſh imitation of the moſt, who (as Wiſe men note) are the worſt Husbands, who only try what the earth will do of its ſelf, and ſeek not to help it with ſuch means as Nature hath provided, whereas if men were careful and induſtrious, they ſhould find that the Earth would yeeld in recompence for a good Husbands travail and charge centuplum, without corrupt Uſury an hundred for one.

A large Letter concerning the Defects and Remedies of Engliſh Husbandry, written to Mr. *Samuel Hartlib.*

SIR,

ACcording to your deſires, I have ſent you what I have obſerved in *France*, about the ſowing of a Seed called commonly, *Saint Foine*, which in *Engliſh* is as much to ſay as *Holy-Hay*, by reaſon, as I ſuppoſe, of the excellency of it. It's called by *Parkinſon* in his *Herball*, where you may ſee a perfect deſcription of it, *Conobrychis Vulgaris*, or *Cocks head*; becauſe of its flower, or *Medick Fetchling*: By ſome it is called *Polygala*; becauſe it cauſeth cattel to give abundance of milk. The plant moſt like unto it, and commonly known, being frequently *ſown* in Gardens, is that which is called *French Honeyſuckle*, and is a kind of it, though not the ſame. *France* although it be ſuppoſed, to want the feweſt things of any *Province* in *Europe*: yet it hath no ſmall want of *Hay*, eſpecially about *Paris*; which hath neceſſitated them to ſowe their dry and barren lands with this ſeed. Their manner of ſowing it, is done moſt commonly thus: When they intend to let their Corn-lands lye, becauſe they be out of heart, and not ſcituate in a place convenient for manuring, then they ſowe that land with *Oats*, and theſe Seeds together about equal parts: the firſt year they onely mowe off their *Oats*, leaving the *Saint Foine* to take root and ſtrength that year: Yet they may if they pleaſe, when the year is ſeaſonable, mowe it the ſame year it is ſown, but it's not the beſt way to do ſo: the year following they mowe it, and ſo do ſeven years together; the ordinary burthen is about a load, or a load and a half in good years, upon an *Arpent*, (which is 100 ſquare Poles or Rods,

every Pole or Rod being 20 foot) wuich quantity of ground being nigh a 4th part leſs then an *Engliſh* Acre; within a league of *Paris*, is uſually Rented at 6 or 7 s. After the land hath reſted 7 years; then they uſually break it up, and ſowe it with corn till it be out of heart, and then ſowe it with *Saint Foine* as formerly: for it doth not impoveriſh land, as *Annual Plants* do; but after ſeven years, the roots of this plant being great and ſweet, as the roots of *locoriſs*, do rot, being turned up by the Plough, and enrich the land. I have ſeen it ſown in divers places here in *England* eſpecially in *Cobham-Park* in *Kent*, about 4 miles from *Graveſend*; where it hath thriven extraordinary well upon dry Chalky Banks, where nothing elſe would grow: and indeed ſuch dry barren land is moſt proper for it (as moiſt rich land for the great *Trefoile*) or great *Clover-Graſs* (although it will grow indifferently well on all lands) and when the other Graſſes and Plants are deſtroyed by the parching heat of the Sun; becauſe their roots are ſmall and ſhallow; this flouriſheth very much, having a very great root, and deep in the ground, and therefore not eaſily to be *exſiccated*; As we have obſerved *Ononis* or *Reſt-Harrow* commonly to do on dry lands; but if you ſowe this on wet land, the water ſoon corrupts the root of it. This Plant without queſtion would much improve many of our barren lands, ſo that they might be mowen every year once, at leaſt ſeven years together, and yield excellent fodder for cattel, if ſo be that it be rightly managed: otherwiſe it cometh to nothing, as I have ſeen by experience. I therefore councel thoſe who ſowe this, or the great *Trefoile*, or *Clover-Graſs*, or any other ſort of graſſes, that they obſerve theſe Rules.

1. That they do make their ground fine, and kill all ſorts of other graſſes and plants; otherwiſe they being Native *Engliſh* will by no means give way to the *French* ones; eſpecially in this moiſt climate: and therefore they are to be blamed, who with one ploughing ſowe this or other ſeeds; for the graſs preſently groweth up and choaketh them, and ſo their negligence, and ill Husbandry diſcourageth themſelves and others.

2. Let them not be too ſparing of their ſeeds; for the more they ſowe, the cloſer and thicker they will grow, and preſently fully

fully ſtock the ground, that nothing elſe can grow. And further the ſeeds which come from beyond the Seas, are oftentimes old, and much decayed, and therefore the more ſeed is required.

3. Not to expect above 7 years profit by it; for in that time it will decay, and the naturall graſs will prevail over it; for every plant hath its period: ſome in one year, ſome in 2. As Would, Cole, Rape, Wade, &c. Others in 3. as the common *Thiſtle*, &c. and therefore after 7 years let them either plough the Land up, and ſowe it with that ſame ſeed again, or with other Grain as they do in *France*.

4. Let not *ſheep* or other cattel bite them the firſt year, that they may be well rooted; for theſe graſſes are far ſweeter then the ordinary graſſes; and cattel will eat them down, leaving the other; and conſequently diſcourage their growth.

5. The beſt way, if men will be at the charge, is to make their ground very fine, as they do when they are to ſowe *Barley*, and harrow it even, and then to howe theſe ſeeds in alone without any other grain, as the Gardiners do *Peaſe*; yet not at ſo great a diſtance; but let them make the ranges about a foots breadth one from another, and they ſhall ſee their graſſes flouriſh as if they were green *Peaſe*, eſpecially if they draw the howe through them once or twice that ſummer to deſtroy all the weeds and graſſes: And if they do thus, the great *Clover* and other ſeeds may be mowen even twice the firſt year, as I have experimented in divers ſmall plots of ground.

There is at *Paris* likewiſe another ſort of fodder, which they call *La Lucern*, which is not inferior, but rather preferred before this *Saint Foine*, for dry & barren grounds; which hath bin lately brought thither, and is managed as the former; and truly every day produceth ſome new things, not only in other Countreys, but alſo in our own. And though I cannot but very much commend theſe plants unto my *Countreymen*, knowing that they may be beneficial to this *Nation*; yet I eſpecially recommend unto them a famous kind of graſs growing in *Wiltſhire*, 9 miles from *Saliſbury*, at *Maddington*, which may better be called one of the wonders of this land, then the *Hawthorn-tree* at *Glaſſenbury*, which ſuperſtition made ſo famous: for divers of the ſame kind are found elſewhere. You may find this

graſs briefly deſcribed in a Book called *Phytologia Britannica*, (which lately came forth, and ſets down even all the plants which have been found naturally growing in *England*) *Gramen Caninum Supinum Longiſſimum*, which groweth 9 miles from *Salisbury*, at Mr. *Tuckers* at *Madington*: wherewith they fat *hogs*: and which is 24 foot long, a thing almoſt incredible; yet commonly known to all that ſhire. Now without queſtion, if the ſeed of this graſs, be ſown in other rich Meadows, it will yeild extraordinarily: though perchance not ſo much, as in its proper place. I wonder that thoſe that live thereabouts, have not tryed to fertilize their other Meadows with it: for it is a peculiar *ſpecies* of graſs: and though ſome ingenious men have found about 50 *ſpecies* of graſſes in this *Iſland*: yet there is none like to this, that can by any means be brought to ſuch an height and ſweetneſs. And truly I ſuppoſe, that the through examination of this graſs, is a thing of very great importance, for the improvement of *Meadows* and *Paſtures*; and it may excel the Great *Trefoile*, *Saint Foine*, *Lu-Lucern*, or any *exotick* plant whatſoever. And though I am very unwilling to exceed the bounds of an Epiſtle; yet I cannot but certifie you, wherein the *Husbandry* of this *Nation* in other particulars (as I ſuppoſe) is greatly deficient, which I will do as briefly as may be: and likewiſe, how ingenious men may find *Remedies* for theſe *deficiencies*.

1. *Deficiencycon-cerning Ploughs and Carriages.*

Firſt, He would do the honeſt and painfull *Husbandman* a very great *pleaſure*, and bring great *profit* to this *Nation*, who could *facilitate* the going of the *plough*, and lighten our ordinary *Carriages*. I wonder that ſo many excellent *Mechanicks*, who have beaten their brains about the perpetuall Motion and other curioſities, that they might find the beſt wayes to eaſe all Motions, ſhould never ſo much as honour the *Plough* (which is the moſt neceſſary Inſtrument in the world) by their labour and ſtudies. I ſuppoſe all know, that it would be an extraordinary benefit to this Countrey, if that 1 or 2 horſes could plough and draw as much as 4 or 6, and further alſo, that there is no ſmall difference in *ploughs*, and *waggons*, when there is ſcarce any ſure rule for the making of them; and every Countrey, yea almoſt every County, differs not onely

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in the *ploughs*; but even in every part. Some with wheels, others without; some turning the *Reſt* (as they call it) as in *Kent*, *Picardy*, and *Normandy*, others not: some having *Coulters* of one faſhion, others of another; others as the *Dutch*, having an iron wheel or circle for that purpoſe; some having their *ſhears* broad at point, some not; some being round, as in *Kent*, others flat: some tying their horſes by the tail, as in *Ireland*. So, likewiſe *Waggons* and *Carts* differ: some uſing 4 wheels, others 2 only; some carrying timber on 2 wheels in a Cart, others with 4 wheels, and a long pole only between, which is the beſt way: some plough with 2 horſes only, as in *Norfolk*, and beyond Seas, in *France*, *Italy*, where I never ſaw above 3 horſes in a *plough*, and one onely to hold and drive: But in *Kent* I have ſeen 4. 6, yea 12 horſes and oxen; which variety ſheweth, that the *Husbandman*, who is ordinarily ignorant in *Mechanicks*, is even at his wits end in this Inſtrument, which he muſt neceſſarily uſe continually. Surely he ſhould deſerve very well of this *Nation*, and be much honoured by all, that would ſet down exact Rules for the making of this moſt neceſſary, yet contemned *Inſtrument*, and for every part thereof: for without queſtion there are as exact Rules to be laid down for this, as for *Shipping* and other things. And yet in *Shipping*, how have we within *theſe* 6 *years* out-ſtripped our ſelves, and gone beyond all *Nations*? for which Art ſome deſerve Eternal honour. And why may we not in this? I know a Gentleman, who now is beyond Seas, where he excels even the *Hollanders*, in their own buſineſſe of draining; who promiſeth much in this kind, and I think he is able to perform it; I could wiſh, he were called on to make good his promiſe. In *China*, it is ordinary to have waggons to paſs up and down without horſes or oxen, with Sails as Ships do: and lately in *Holland* a waggon was framed, which with ordinary Sails carried 30 people 60 *Engliſh* miles in 4 hours. I know ſome excellent Scholars, who promiſe much by the means of *Horizontal ſails* (*viz.*) to have 3 or 4 Ploughs together, which ſhall likewiſe both ſowe and harrow without horſes or oxen.

I dare not being ignorant in these high speculations, engage my self to do much thereby; but wish these Gentlemen, whom I know to be extreamly ingenious, would attempt something, both for the satisfying of themselves and others. There is an ingenious *Yeoman* of *Kent*, who hath two ploughs fastened together very finely, by the which he plougheth two furrows at once, one under another; and so stirreth up the land 12 or 14 inches deep, which in deep land is good. Near *Greenwich* there liveth an *Honourable Gentleman*, who hath excellent Corn, and yet plougheth his land with one horse, when as usually through *Kent* they use 4 and 6. These things shew that much may be done in this kind; and I hope some in these active times, will undertake and accomplish this work of so great importance.

Col. Blunt.

2 Deficiency, about digging of land, Setting and Howing in of corn.

There is a Book long since printed, made by Sir *Hugh Plattes*, (the most curious man of his time) called *Adams Art revived*, wherein is shewed the great benefit which would accrue to this Nation, if all land which were fit to be digg'd, were so ordered, and their corn set. Mr. *Gab. Plattes* likewise hath written much of this kind, and promiseth that men shall reap 100 for one; all charges born which are very great. That this may be true, he bringeth some probable Reasons, supposing that less then a peck of *Wheat*, will set an Acre, I dare not promise so much as these *Gentlemen* do, neither can I commend Mr. *Gab. Plattes* setting Instrument: For I know there are many difficulties in it, which he himself could never wade through; but concerning digging, and setting, and howing in of corn, these things I dare maintain.

1. That it is a deficiency in *Husbandry*, that it is used no more.

2. That one good digging, because it goeth deeper then the Plough, and buryeth all weeds, killeth the grasses; is as good as three Ploughings, and if the land be mellow, not much more chargeable.

3. That it would imploy many thousand of people, that a third part of the seed might be saved. As I have found by experience, that all the weeds and grasses, might be more easily destroyed thereby, and the ground better accommodated for other crops; and to conclude, the crop considerably greater

er. Yet thus much I muſt further ſay, concerning ſetting of Grain, That great *Beans* are even of neceſſity to be ſet, and that ſmall *Beans* in *Surrey*, and other places, are likewiſe ſet with profit, for the reaſons above mentioned; that to ſet *Peaſe* (unleſs *Haſtevers*, and *Roncivals*) *Oats*, *Barley*, is a thing even ridiculous: that *Wheat* although in divers grounds it may be ſet with profit: yet to *how it in* (as the *Gardiners* ſpeak) as they do *Peaſe*, though not at the ſame diſtance, but about a foot the ranges one from another, is better then ſetting for theſe Reaſons.

1. Becauſe to ſet Corn is an infinite trouble and charge; and if it be not very exactly done, which children neither can nor will do, and theſe muſt be the chief ſetters; will be very prejudicious.

2. If worms, froſt, ill weather, or fowls, deſtroy any part of your ſeed, which they will do; your crop is much impaired.

3. The ground cannot be ſo well weeded, and the mould raiſed about the roots by the *how*. Which 3 inconveniences are remedied by the other way.

Further, I dare affirm, that after the ground is digged or ploughed and harrowed: even it's better to *howe Wheat in*, then to ſowe it after the *common* way; becauſe that the weeds may be eaſily deſtroyed by running the *howe* through it in the Spring, and the mould raiſed about the roots of the Corn, as the *Gardiners* do with *Peaſe*, it would ſave much Corn in dear years, and for other Reaſons before mentioned. Yea, it is not more chargeable; for a *Gardiner* will *howe in* an Acre for 5 s. and after in the Spring for leſs money run it over with a *howe*, and cut up all the weeds, and raiſe the mould: which charges are not great, and you ſhall ſave above a buſhel of ſeed, which in dear years is more worth then all your charges.

Further, 1 s. 6 d. or 2 s. an Acre for the ſowing and harrowing of an Acre in *Kent*, is accounted a reaſonable price, and may be ſaved; but if any fear charges, let him uſe a *Dril-Plough*, with one horſe, which is commonly known at *Fulham*, and about *London*. I therefore cannot but commend the *howing in*

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of *Wheat*, as an excellent piece of good *Husbandry*, whether the ground be digged or ploughed; not only becauſe it ſaveth much Corn, imployeth much people, and it is not chargeable; but it alſo deſtroyeth all weeds, fitteth grounds for after crops and cauſeth a greater increaſe, and in my apprehenſion is a good *Remedy* againſt *Smut* and *Mildew*. There is an Ingenious *Italian*, who wondreth how it cometh to paſs, that if one ſetteth a Grain of Corn, as *Wheat*, *Barley*, &c. it uſually produceth 300 or 400. yea, 1000, 2000, as I have tryed: yet if you ſow *Wheat* after the ordinary way, 6 or 8 for one is accounted a good crop: what becometh of all the Corn that is *ſown*, when as the 50th part, if it do grow, would be ſufficient? For anſwer to this.

1. I ſay much Corn is ſown, which nature hath deſtinated for the *Hens* and *Chickens*, being without any conſiderable vegetative faculty.

2. Worms, Froſts, Floods, Crows and Larks, (which every one doth not conſider) do devour not a little.

3. Weeds, as *Poppy*, *May-weed*, and the graſſes growing with the Corn do deſtroy much.

Laſtly, When Corn is ſo ſown after the ordinary manner, much is buried in the furrows; eſpecially if the ground be grazy: much is thrown on heaps in holes, and conſequently ſtarve and choak one another. Moſt of theſe Inconveniencies, are to be remedyed by this way of ſetting and howing in of Corn.

3. *Deficiency, concerning Gardening.* *Gardening*, though it be a wonderfull improver of lands, as it plainly appears by this, that they give extraordinary rates for land, (*viz.*) from 40 s. *per* Acre to 9 pound, and dig and howe, and dung their lands, which coſteth very much; Yet I know divers, which by 2 or 3 Acres of land maintain themſelves and family, and imploy other about their ground; and therefore their ground muſt yeild a wonderfull increaſe, or elſe it could not pay charges; yet I ſuppoſe there are many *Deficiencies* in this calling.

1. Becauſe it is but of few years ſtanding in *England*, & therefore not deeply rooted, nor well underſtood. About 50 years ago, about which time *Ingenuities* firſt began to flouriſh in *England*;

England; This *Art* of *Gardening*, began to creep into *England*, into *Sandwich*, and *Surrey*, *Fulham*, and other places.

Some old men in *Surrey*, where it flouriſheth very much at preſent; report, That they knew the firſt *Gardiners* that came into thoſe parts, to plant *Cabages*, *Colleflowers*, and to ſow *Turneps*, *Carrets*, and *Parſnips*, to ſow *Raith*, (or early ripe) *Peaſe*, *Rape*, all which at that time were great rarities, we having few, or none in *England*, but what came from *Holland*, and *Flanders*. Theſe *Gardiners* with much ado procured a plot of good ground, and gave no leſs then 8 pound *per* Acre; yet the *Gentleman* was not content, fearing they would ſpoile his ground, becauſe they did uſe to dig it. So ignorant were we of Gardening in thoſe days.

2. Many parts of *England* are as yet wholly ignorant. With- *Graveſ-*
in theſe 20 years, a famous *Town* within leſs then 20 miles off *end.*
London, had not ſo much as a Meſs of *Peaſe*, but what came from *London*, where at preſent *Gardening* flouriſheth much, I could inſtance divers other places, both in the *North* and *Weſt* of *England*, where the name of *Gardening*, and *Hearing* is ſcarcely known, in which places a few *Gardiners* might have ſaved the lives of many poor people, who have ſtarved theſe dear years.

3. We have not *Gardening*-ware in that plenty and cheapneſs (unleſſe perhaps about *London*) as in *Holland*, and other places, where they not onely feed themſelves with *Gardiner's* ware, but alſo fat their *Hogs* and *Cows*.

4. We have as yet divers things from beyond Seas, which the *Gardiners* may eaſily raiſe at home, though nothing nigh ſo much as formerly; for in *Queen Elizabeths* time, we had not onely our *Gardiners* ware from *Holland*, but alſo *Cherries* from *Flaunders*; *Apples* from *France*; *Saffron*, *Licoriſh* from *Spain*; *Hops* from the *Low-Countreys*: And the *Frenchman* who writes the *Treaſure Politick* ſaith, That it's one of the great *Deficiencies* of *England*, that *Hops* will not grow, whereas now it is known, that *Licoriſh*, *Saffron*, *Cherries*, *Apples*, *Pears*, *Hops*, *Cabages* of *England*, are the beſt in the world. Notwithſtanding we as yet want many things: as for *example*: We want *Onnions*, very many coming to *England* from *Flaun-*

ders, Spain, &c. Madder for dying cometh from *Zurick-Sea* by *Zealand*; we have *Red Roſes* from *France*, *Annice-ſeeds*, *Fennil-ſeeds*, *Cumine*, *Caraway*, *Rice* from *Italy*, which without queſtion would grow very well in divers moiſt lands in *England*; yea *Sweet-Marjoram*, *Barley*, and further, *Gromwell-ſeed*, and *Virga Aurea*, and *Would*, from the *Weſtern Iſles*, though they grow in our hedges in *England*.

Laſtly, *Gardening* is *deficient* in this particular: that we have not *Nurceries* ſufficient in this land of *Apples*, *Pears*, *Cherries*, *Vines*, *Cheſtnuts*, *Almonds*, *&c.* but Gentlemen are neceſſitated to ſend to *London* ſome hundred miles for them.

Briefly, for the advancement of this ingenuous calling, I oneiy deſire, that *Induſtrious Gentlemen* would be pleaſed to encourage ſome expert workmen into the places where they live, and to let them land at a reaſonable rate, and if they be poor and honeſt, to lend a little ſtock: they will ſoon ſee the benefit that will redound, not only to themſelves, but alſo to all their Neighbours, eſpecially the poor, who are not a little ſuſtained by the *Gardiners* labours and ingenuities.

4. *Deficiency in Smut and Mildew.*

4. Our Husbandry is *deficient* in this, that we know not how to *remedy* the *infirmities* of our *growing Corn*; eſpecially *Smut* and *Mildew*, to inſtance in theſe two onely, which oftentimes bring great calamities to theſe Nations: *Smut* in wet years, *Mildews* in dry. Theſe diſtempers in Corn, are not onely in our Countrey; but alſo in other places. A learned Authour *Helmont.* ſaith, that *Smuttineſs* of Corn, which maketh it ſmell like a *Red Herring*, was not known in *France*, till about 1530. at which time the great foul diſeaſe began to break forth in thoſe parts very hotly, which he conceiveth from hence to have ſome original; as alſo the camp-diſeaſe. *Mildews* are very great in the Kingdom of *Naples*, which oft ſtick to the ſithes of thoſe that mow graſs and corn: and (God be thanked) we are not troubled with *Locuſts*, which is a great flying *Graſs-hopper*, nor *Palmer-Worms*, which is a kind of great black *Cater-piller*, (which I have ſeen deſtroying much in *New-England*) nor with great *hail* in Summer, nor with great *drought*, which ſtifleth the ear in the ſtalk; which *Calamities* in *hot Countreys*, do very oft

oft totally deſtroy the honeſt and patient *Husbandman's* labours: neither are we troubled with extream *colds*, which in *New-England* and other cold *Countreys*, doe oft deſtroy the Corn. But to return to our purpoſe.

And firſt, briefly to ſhew you my opinion concerning the *Cauſes of Smuttineſſe*. I deſire not to fetch *Cauſes* afar off, and to tell you of the ſad *Conjunctions* of *Mars* and *Saturn*, (for I think *Quæ ſupra nos*, belong not to us) when as we have enough at home: This is certain, that there are many evident cauſes of this corruption of Corn.

1. A moiſt ſeaſon about *Kerning*-time: which moiſture either corrupteth the roots of the Plant, or the nouriſhment of it, or the ſeed in its *Embrio*: or perhaps in ſome meaſure all theſe.

2. Low, moiſt, foggy ground, for the reaſons above mentioned.

3. Dung'd land. In *Vineyards* it's obſerved, that dung cauſeth more increaſe in quantity, but leſs in goodneſs, ſo that the ill-taſte of the dung may eaſily be diſcerned; becauſe wine hath an high taſte, without queſtion the ſame happeneth to other Plants, although it be not ſo eaſily diſcerned; for the ferment or ill odour of the dung, cannot be over-maſtered by the Plants, as we ſee alſo in *Animals*, that corrupt diet cauſeth unſavory taſts in the fleſh: ſo *hogs* in *New-found-land*, where they are nouriſhed by *fiſh*, may by their *taſts* be called rather *Sea-porpuſſes*, then *Land-ſwine*.

4. The ſowing of *Smutty* Corn oft produceth *Smuttyneſs*; the ſon like unto the father: I account *Smutty* Corn an *imperfect* or *ſick* Grain, and ſuppoſe that by a *Microſcope* the imperfection may be diſcerned.

Laſtly, The ſowing of the ſame ſeed oft on the ſame field, cauſeth *Smuttyneſs*; becauſe that *nitrous juice*, which is convenient for the nouriſhment of the Grain, hath been exhauſted in the precedent years; and therefore it is excellent *Husbandry* every year to change the *ſpecies* of Grain, and alſo to buy your Seed-Corn, from places far diſtant. I am informed of a *Gentleman*, who did ſowe ſome *Wheat* which came from *Spain*, where the Grain is uſually very hard and flinty,

and as it were tranſparent, and far weightier then ours (as it appeareth by a meaſure at *Amſterdam*, which holdeth about 3 buſhels, and in our *Wheat* of the *Northern* parts weigheth 160, whereas the *Southern* Corn weigheth ſomtimes 180, 200, 220.) and had a crop beyond expectation.

The uſual *Cures* of *Smuttyneſs*, beſides thoſe mentioned before, are theſe

1. To lime your ground, which warmeth and dryeth the Land.

2. To lime your Corne, which is done thus. Firſt, Slack your lime, and then moiſten your Corn or lime, and ſtir them together, till your Grain be as big as a ſmall *Peaſe*. This liming preſerveth Corn likewiſe from birds and worms, and is found a very good *Remedy* againſt this diſeaſe: others make a ſtrong lye with common ſalt, and ſteep their Corn in it all night, and then draw away their lye for further uſe; which ſeldom faileth of its deſired effect. Whether this ſtrong lye doth by its *corroſiveneſs*, mortifie the weak and imperfect Corn, ſo that it will not grow; Or whether it be a *Remedy*, to cure the imperfections thereof, is worth the enquiry? I ſuppoſe this lye doth *exſiccate* the *ſuperfluous humidity*, which is the cauſe of this corruption. If Corn be brought into the Barn very *Smutty*, in *Kent* they uſually threſh it on dry floors, planked with boards; by which means, the *Smuttyneſs* is beaten away, and ſticketh not to the Grain, onely a little blackneſs appeareth about the eye, but if it be threſhed on a moiſt floor, the blackneſs ſticketh to the Grain, which therefore appeareth dark, and is ſold at a lower rate to the Bakers.

Mildew is without queſtion an *unctuous* dew, which deſcendeth from above about *Midſomer*; it aboundeth in dry years, as *Smuttyneſſe* in moiſt. I cannot think that there is ordinarily any Malgnity in this dew, but it produceth its effect by manifeſt cauſes, *viz.* from an *oily viſcuous* quality, which ſtoppeth the *pores* of the husk wherein the *Wheat* lyeth, and depriveth it from the Ayre, and conſequently from nouriſhment: for the Ayre is the life of all things. I have heard, and do believe, that if you ſtreak any ear of *Wheat* with oyl,

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it will produce the ſame effect. I am ſorry that I never tryed, that I might better underſtand the nature of this ſad calamity which often undoeth the Induſtrious *Husbandman*: and cauſeth great ſcarcity in this *Iſle*. It is to be obſerved further, that *Wheat* onely ſuffereth conſiderable damage by *Mildew*; becauſe it lyeth in a chaffy husk, which other Grains do not. The *Grounds* moſt ſubject to *Mildew*, are theſe.

1. Thoſe that are *encloſed* with *Trees* and *high Hedges*. And truly this is the onely great *Inconveniency* I find by *encloſures*.

2. *Low Valleys*: I have ſeen very oft in the ſame field, the banks fine bright Corn; and all the *lower* parts, though greater in *ſtraw*; yet little worth by reaſon of the *Mildew*.

3. *Dung* made of *ſtraw*, I have obſerved to diſpoſe much to *Mildew*, and *Sheeps dung* to be a kind of *Antidote* againſt it: as alſo *Pigeons-dung*; becauſe, as I conceive, theſe 2 laſt ſorts abound much in *Niter*, which produceth a firm, hard, bright Corn, not eaſily to be putrefied; but the other being more oily and *Sulphureous*, cauſeth a dark *Spungy* Corn, ſoon corruptible. And 2. becauſe *ſtraw* and *dung* is a part of the ſame kind corrupted, which is always in ſome meaſure hurtful to the ſame *ſpecies*, both in *Animals*, and all *Vegetables*, and therefore *rotten ſticks*, or the *earth* proceeding from them, is found hurtful to the *roots* of *trees*; and *trees* will hardly grow, where *Roots* of other *trees* have formerly been *corrupted*.

The *Remedies* for this *Accident*, briefly are theſe. (Not to ſpeak of *Bees*, who queſtionleſs make moſt of their *Honey* from theſe *Honeys* or *Mildews*: for they gather very little, in compariſon of that which falleth.)

1. The beſt way is to cut down the trees about your ground, and your hedges low, that the wind may *ventilate* your Corn.

2. To ſowe early; that your Corn may be full *Kerned*, before theſe *Mildews* fall. I am informed, that an Ingenious *Knight* in *Kent*, did for curioſity ſowe *Wheat* in all months of the year, and that the Corn ſown in *July*, did produce ſuch an increaſe, that it is almoſt incredible; and truly I think it a Sir *Cheney Culp.*

great fault in many places that they ſow late, for many reaſons: I am ſure in *France*, they uſually ſowe before *Michaelmas*.

3. Some uſe (and with good profit) to draw a line over their Corn, and to ſtrike off the *Mildew*, before it be *inſpiſſated* by the Sun; This ought eſpecially to be done before Sunriſing: two men in an hour will eaſily run over an Acre; the *Mildews* uſually fall like a *thick fog*, or a *Miſty rain*; if you go to your *Bees*, you will ſoon perceive it by their extraordinary labour, very early in the morning.

4. The uſe of a kind of *bearded Wheat*, is an excellent *Remedy*: for the beard ſhooteth off the *dew*, that it doth not ſo eaſily inſinuate it ſelfe into the *ear*, and likewiſe cauſeth the *ear* to ſhake by the leaſt wind. There is a kind of *Wheat* in *Buckinghamſhire* called *Red-ſtraw-Wheat*, which is much commended: it's a ſtrong-ſtalked *Wheat*, and doth not ſoon lodge, and therefore excellent for *Rank* Land where Corn is apt to lodge, and conſequently to *Mildew*; but I queſtion whether it hath any property againſt *Mildew*. This I am very confident of, that if this *Wheat*, or any other, were without the Chaffy husks expoſed bare to the Aire; as *Barley* and *Rie* are, *Wheat* would not be afflicted with *Mildew*. Perhaps ſuch Grain may be found by diligent enquiry. I have caſually picked out of a *Wheat*-field ſome ſtalks, which had two ears on them: and though *Barley* uſually hath but 2 ranges in the South of *England*, yet I have ſeen ſome ſorts with 4, 6, and there are many great varieties in grains not yet diſcovered. Truly if any knoweth better ways then theſe, how to cure this Malady of *Mildew*, he is much to blame, if he do not publiſh it for the good of his *Countrey-men*.

5. *Deficiency concerning the planting of Apples, Pears, Cherries, & Plums.*

I will not here ſet down the divers manners of *Graftings* and *Inoculations*, which nevertheleſs is an Art abſolutely neceſſary in Planting; for every Book of *Husbandry* doth ſhew it, and every *Gardiner* can teach it thoſe who are deſirous to learn it: Neither will I ſet down all the ſorts of *Apples*, *Pears*, *Cherries*, *Plums*, &c. For it would be too tedious a diſcourſe; and Mr. *Parkinſon* hath already very excellently done it, in his

his Book called *Paradiſus Terreſtis*, where at leaſure you may read it. I will only point briefly at the *Deficiencies*, which I find in this part of *Husbandry*, and the beſt ways to *Remedy* them.

1. I ſay, that it is a great *Deficiency* in *England*, that we have not more *Orchards* planted. It's true, that in *Kent*, and about *London*, and alſo in *Gloceſterſhire*, *Hereford*, and *Worceſter*, there are many gallant *Orchards*, but in other *Countreys*, they are very rare and thin: but if there were as many more, even in any *Countrey*, they would be very profitable. I know in *Kent*, that ſome advance their ground even from 5 s. *per* Acre, to 5 pound by this means, and ſo proportionally; and if I ſhould relate what I have heard by divers concerning the profit of a *Cherry-Orchard*, about *Sittenborn* in *Kent*, you would hardly believe me; yet I have heard it by ſo many, that I believe it to be true: Namely, that an *Orchard* of 30 Acres of *Cherries*, produced in one year above 1000 pound, but now the Trees are almoſt all dead; it was one of the firſt *Orchards* planted in *Kent*. Mr. *Cambden* reporteth, that King *Henry* the Eighth's *Gardiner*, firſt began to plant *Flemiſh Cherries* in thoſe parts, which in his time did ſpread into 32 other *Pariſhes*, and were at that time ſold at greater rates then now; yet I know that 10, or 15 pound an Acre hath been given for *Cherries*; more for *Pears*, and *Apples*.

2. There is a great *Deficiency* in the ordering of *Orchards*, in that they are not well pruned, but full of *Moſs*, *Miſletoe*, and *Suckers*, and oftentimes the ground is packed too thick of Trees; for they ſhould ſtand at leaſt 20 foot aſunder; neither will ill husbands beſtow dunging, digging, or any other coſt on *Orchards*, which if they did, might pay half their Rents in ſome places. One told me for a Secret, a Compoſition for to make Trees bear much and excellent fruit, which was this: Firſt, in an old Tree, to *ſplit* his root; then to apply a *Compoſt* made of *Pigeons* dung, *Lees* of wine, or ſtale, *Urine*, and a little *Brimſtone*, (to deſtroy the worms) it hath ſome probability of truth: for by experience I know that a buſhel of *Pigeons* dung hath cauſed a Tree to grow and bear,

which

which for divers years before ſtood at a ſtand; but concerning the *ſplitting the roots*, I know not what to ſay. Some old *Authours* affirm this ought to be done; becauſe that the roots may as well be hide-bound, as other parts of the Tree, and not able to attract his nouriſhment, and when the Root is ſplit, it will ſpeedily ſend forth divers ſmall *fibrous* roots; which are the principall *Attractors*. It were good that ſome would give us an account exact of this *Experiment*. But ſome will object againſt *Orchards*, that they ſpoyl much ground, and therefore ought to be planted only in *Hedges*. To this I anſwer.

1. That *Plumtrees* and *Damſins* may very well be planted in hedges, being ordinarily thorny Plants; this is uſed very much in *Surrey* and *Kent*, where the *Plums* uſually pay no ſmall part of their Rent; yet I never ſaw in theſe Southern parts of *England* any *Apples* or *Pears* thrive in an *Hedge*, unleſs a *Crab*, or a *Wilden*, or ſome *Sweeting* of little worth. How they thrive in *Herefordſhire*, and thoſe places, I know not.

2. The *Inconveniences* of *Orchards* planted at 20 or 30 foot diſtance, is not worth ſpeaking of: for this is the uſual courſe in *Kent*, when they plant any ground, they exactly place them in rank and file, and then plough their Lands many years, and ſowe them with Corn, till the *Orchard* beginneth to bear fruit; then they lay them down for *paſture*, which *paſture* is not conſiderably *ſoure*; but hath this advantage above other *Paſtures*.

1. That it is ſooner grown by 14 dayes in the Spring than the *Medows*, and therefore very ſerviceable.

2. In *Parching Summers* here is *plenty*, when other places have ſcarcity.

3. There are great ſhelters for Cattel, eſpecially *ſheep*, who will in thoſe places, in great Snows ſcrape up meat, which in other places they cannot do: and if the paſture were *ſour*, yet the loſs is not great; for it will be a convenient place for the *Hogs* to run in, who muſt have a place for that purpoſe, where there are no Commons.

4. I ſay, that the *Benefits* are ſo many by *Orchards*, that you ought not like an ungratefull man to thruſt them up to the hedge: for they afford curious walks for pleaſure, food for cattel, both in the Spring early, and alſo in the *parching Summer*, and *nipping ſnowy Winter*: They afford fuel for the fire, and alſo ſhades for the heat, phyſick from the ſick, refreſhment for the ſound, plenty of food for man, and that not of the worſt, and drink alſo even of the beſt, and all this without much labour, care or coſt, who therefore can juſtly open his mouth againſt them.

3. *Deficiency* is, that we do not improve many excellent Fruits, which grow amongſt very well, and that we have as yet many fruits from beyond Seas, which will grow very well with us. I paſſe by the generall and great Ignorance, that is amongſt us, of the variety of *Apples*, of which there are many ſorts which have ſome good and peculiar uſes; moſt men contenting themſelves with the knowledge of half a ſcore of the beſt, thinking the vertues of all the reſt are comprehended in them: as alſo of the variety of *Pears*, which are incredibly many. A *Friend* of mine near *Graveſend*, hath lately collected about 200 *ſpecies*. I know another in *Eſſex*, (Mr. *Ward*) who hath nigh the ſame number. I hear of another in *Worceſterſhire*, not inferiour to theſe. In *Northamtonſhire*, I know one, who hath likewiſe collected very many. So that I dare boldly ſay, there are no leſs in this *Iſland* then 500 *ſpecies*; ſome commended for their early ripeneſſe; ſome for excellent taſtes; ſome for beauty; others for greatneſs; ſome for great bearers; others for good Bakers; ſome for long laſters, others for to make *Perry*, &c. But to our purpoſe: I ſay many rare fruits are neglected: To inſtance.

1. In the *Small-nut* or *Filberd*, which is not much inferiour to the beſt and ſweeteſt *Almonds*.

2. The great *Damſin* or *Prunin-plum*, which groweth well, and beareth full in *England*.

3. *Almonds*, which groweth well and beareth good fruit, as I have ſeen divers buſhels on one Treee in my Brothers *Orchard*.

4. *Walnuts*, which is not a fruit to be deſpiſed.

5. *Vines* and *Mulberies*, but of theſe preſently in another place. I might likewiſe adde *Currants*, *Raſpeſes*, of which excellent drinks may be made.

6. *Quinces*, Of the which I cannot but tell you that a *Gentleman* at *Prichenel* in *Eſſex*, who had a Tree from beyond Sea, hath the beſt in *England*, and hath made above 30 pound of a ſmall piece of ground planted with them, as I have heard from his own Wifes mouth. And therefore it is by reaſon of our ill *Husbandry*, that we have *Quinces* from *Flaunders*, *Small-nuts* from *Spain*, *Prunes* from *France*, and alſo *Walnuts*; and *Almonds* from *Italy*, and *Cheſtnuts* (which I had almoſt forgot) from *Portugal*. And now I cannot but digreſs a little, to tell you a ſtrange and true ſtory, with my opinion of it. In divers places of *Kent*, as at and about *Graveſend*, in the Countrey and elſewhere, very many of the prime *Timbers* of their old Barns and Houſes are of *Cheſtnut-Wood*, and yet there is ſcarce a *Cheſtnut-Tree* within 20 miles of that place, and the people altogether ignorant of ſuch Trees. This ſheweth that in former times thoſe places did abound with ſuch timber; for people were not ſo fooliſh ſurely in former times, to run up and down the World, to procure ſuch huge maſſey Timbers for Barns and ſuch Buildings when as there was plenty of *Oakes* and *Elmes*, at their doors: And further, it ſheweth, that theſe Trees will grow again with us to a great bigneſſe. This putteth into my mind the Story of the *Moor-logs*, which are found in divers places of the North of *England* in *Moors* many foot deep; which logs are long and black, and appear to be a kind of *Fir* or *Pine*; and yet in thoſe places, people are altogether ignorant of theſe Trees, the Countrey not producing any of theſe *ſpecies*. The firſt Story of *Kent*, which I know to be true, cauſeth me to wonder the leſſe at the latter: for I ſee that a *ſpecies* of wood, may be deſtroyed, even totally in a place. And

2. I know, that in *Virginia* and *New-England*, that *Pines*, and *Firs* and *Cedars*, do grow wonderfully thick in ſuch *Moors* or *Swamps*, and being light wood, and eaſily wrought, they

they are continually uſed, while they laſt, for buildings. Further, I ſuppoſe theſe *Moors* are *Commons*, to the which the poor have uſed to reſort for firing, and how ſoon great woods will be conſumed by them, every one making what havock he pleaſeth, all men know. As concerning their being ſo deep in the ground, and their blackneſs; I ſuppoſe that when wood was abundant in thoſe places, every one did cut what they pleaſed, and left what was not for their turns, which being in moiſt places, was ſoon glutted with moiſture, and made ponderous; by which means it ſoon buried it ſelf, as Ships do, on Quickſand, or perhaps the *Turf* (which hath a peculiar faculty vegetative, for where it is exhauſted, it ſoon groweth again) in time hath grown over them; the people permitting it, becauſe that wood, once *ſobbed* in wet, is of little uſe, as we ſee by *Piles* on the *Marſhes*-ſide, ſcarce any man vouchſafing to carry them home. The blackneſs of this wood proceedeth, as I ſuppoſe, from the ſooty fume, or *evaporation* of the black *turf*, (which endeavoreth, as all earths do) to reduce all things into its own nature; which though it be not able fully to accompliſh; yet it introduceth divers diſpoſitions, and qualities, as blackneſs in the Wood. Some ſuppoſe, that theſe *Moor-logs* have lain there ever ſince the *flood*, with whom I will not contend; ſeeing that any wood, if it be kept from the Aire continually moiſt or dry, will endure even thouſands of years without putrefaction.

6. *Deficiency*, is the *Not-improving* of our *Fruits* for the beſt ends and purpoſes. *Normandy*, which produceth but little wine, maketh abundance of *Cider*, *Perry*, which they eſtimate equally to wine, if it be made of good fruit. The ordinary *Perry* is made of *Choaky Pears*, very juicy, which grow along by the high-way-ſides, which are not to be eaten raw. In *Biſcay* in *Spain*, where wine is ſcarce, they make *Cider* of a certain ſweet *Apple*, which hath a little *bitterneſſe* in it, and is like to our *ſnouting*, and the *Cider* is very good. And truly here in *England*, if we would make *Cider* and *Perry* of the beſt ſotts of Fruits, which is rarely done, (for we think any fruit good enough for that purpoſe) we might make drinks,

The 6 deficiency concerning not improving our Fruits.

no wayes inferiour to the *French-wines*, which are usually spoiled before they come over the Seas to us, their Spirits soon evapourating. There are two wayes of making *Cider* and *Perry*: one, by bruising and beating them, and then presently to put them into a vessel to *ferment* or work (as it is usually called) of themselves: The other way is to boil the juice with some good *Spices*, by which the rawnesse is taken away, and then to ferment it with some yest, if it work not of it selfe, this is the best way: and I have tasted *Cider* thus made of an excellent delicate taste. Neither let any complaine of the windinesse; for it is onely want of use: When I had for two or three years continually drunk *Wine* beyond Sea, the strongest Beer for two or three weeks was as windy to me, as *Cider* will be to any; and afterwards when I went to *Paris*, the *Wine* of that place was as troublesome as *English beer* for a little time: how much wine might be saved, and also *Malt* if *English-men* did take these good courses, which other *Nations* do, and consequently how much advantage would this *Island* reap thereby? If I were an house-keeper in the Country, I would make excellent *Beer*, *Ale*, *Cider*, *Perry*, *Metheglin*, and *Wine*, of our own *grapes*, and if my Friends would not drinke these, they should drink water, or go away a thirst: I would scorn to honour *France* so much as men do usually; and the *Spaniard* and *Italian* should not laugh at us, and say that we can as well be without *Bread*, as their *Wines*, *Currants*, &c. Thus may many more excellent *Drinks* be made out of our *Fruits*: not to speak of those which are made of our *Grain*, as *Barley*, *Wheat*, &c. yet I must tell you, that I know an *Ingenious* man, who can without malting *Barley*, make a *Drink* not inferiour to *Wine*, and a greater quantity of *Aqua-vitæ* out of them, and with lesse cost, then by the ordinary way, by a peculiar *Fermentation* of his own; which time will discover. There is another *Ingenious* man, who out of *Damsins* and other fat and sweet *Plums*, can make a *Drink* not inferiour to the best *Wines*, and abundance of *Aqua-vitæ*. Many *Ladies* know how to make *Cherry*, *Raspes*-wines; and Sir *Hugh Plattes* in his *Closet* for *Ladies*, discloseth many Secrets of this kind; as also for

for *Conſerves*, *Marmalades*, which are things both delightfull and profitable. I have a kinſman, who can even out of *Black-berries*, make a very pleaſant *Drink*, which curioſity he is unwilling to publiſh. *Glauber* an excellent *Chymiſt* hath divers ſecrets of this kind, even to the advancing of *Haws*, *Heps*, or *Canker-berries*, *Slows*, to excellent *Aqua-vitæ's*, *Drinks*, *Vinegers*, which he himſelf firſt invented. In *Ruſſia* in the *ſpring-time*, it's an uſual cuſtom to pierce the Bark of the *Birch-trees*, which at that time will weep much *liquour*, and yet like children be little the worſe, this the poor ordinarily drink for neceſſity, it's a pleaſant healthful drink; and alſo the rich men, becauſe it's an excellent Preſervative againſt the ſtone. *Helmont.*

The *Means* to advance this profitable and pleaſant Work are theſe.

1. To advance *Nurceries* of all ſorts of *Apples*, *Pears*, *Plums*, *Cherries*, which *Gentlemen* may do for a ſmall matter, and then plant out theſe Trees, when they are grown great enough. The beſt and cheapeſt wayes to raiſe all *Nurcery* Wares, is done thus. *Plums* may be raiſed either of *ſtones*, which when you have eaten the *plums*, may be preſently pricked into the ground, or by *ſlips*, which you will find about the old Trees: *Apples* may be raiſed from *Kernels*, (*Crab-Kernels* are the beſt) which ought to be preſerved in dry ſand, till the *ſpring*, leaſt they grow mouldy: or *Crab-ſtalke* may be fetched out of the woods, and grafted. Some Trees, as *Sweetings*, *Codlings*, *Quinces*, will grow very well of *ſlips*. *Cherries* are very well raiſed by *ſtones*, (the *Black-Cherries* are the beſt) which ſo ſoon as you have eated them, are to be howen into Beds made very fine, the ranges a foot diſtant; beware leſt you let them heat, and take heed of the Mouſe. I have ſeen *Cherry-ſtones* and *Apple-kernels* grow two foot and a half in one year; and conſequently in few years they would be fit to be tranſplanted. The *Art of Grafting*, *Inoculating* a Gentleman will learn in two hours.

2. For the advancing of *Ingenuities* in this kind, as that making of *Vinous-Drinks* out of *Apples*, *Plums*, &c. I counſel all *Ingenious Gentlemen* to try divers *experiments* in theſe kinds; with theſe *Cautions*.

1. That he attempt not great quantities at firſt, which perchance will be chargeable and troubleſome; for by a Gallon he may have as much certainty, as by a Hogſhead.

2. Not to be diſcouraged, if they ſucceed not well at firſt daſh: for certainly there are many *Ingenuities* in theſe fruits which time will diſcover.

3. Proceed by *Fermentation*: for every liquour which will ferment, hath a *vinous* ſpirit in it, and without *Fermentation*, even the beſt fruits will have none.

Laſtly, *Fermentation* is done either *in liquido*, or *humido*; and herein conſiſts ſome Myſtery. I have forgot to ſpeak of *Apricoks*, *Peaches*, *Melicotons*, which are fine pleaſant fruits, yet very dangerous; and therefore called by the *Italians*, *Mazzafranceſe*, that is, *Kill-Frenchman*; and wiſh Ladies, and others to take heed of ſurfeiting by theſe.

The 7 deficiency concerning Vines.

I cannot without much tedioufneſſe, relate the divers ſorts of *Vines*, which are even infinite; *Rome* having in it uſually, 40 or 50 ſorts of *Vines*; and all very good: Other places of *Italy*, *Spain*, *France*, have alſo great varieties; I therefore paſſe them by, as alſo the manner of managing them, becauſe it is deſcribed in the *Countrey-Farm*, and alſo by *Boxvil* a *Frenchman*, who at the Command of King *James*, wrote a ſhort Treatiſe of *Vines* and *Silkworms*, for the inſtruction of the Plantations of *Virginia*. I ſhall only according to my Method ſhew you the *Deficiencies* amongſt us in this particular Plant, and the beſt *Remedies* for it.

And firſt, although I think that the *Vine* is the great bleſſing of God, which *Hot Countreys* eſpecially enjoy, as *temperate Countreys* doe *Milke*, *Butter*, *Cheeſe*, in abundance, and the coldeſt and *Barreneſt Fowl*, and *Fiſh*, in an incredible number; God of his goodneſſe diſtributing ſome peculiar bleſſings to every Countrey: Notwithſtanding I dare ſay, it's probable, that *Vineyards* have formerly *flouriſhed* in *England*, and that we are to blame, that ſo little is attempted to revive them again. There are many places in *Kent* called by the names of *Vineyards*, and the grounds of ſuch a Nature, that it ſeemeth probable they have been ſuch. I hear further by divers

divers people of credit, that by Records it appeareth, that the Tythes of *wine* in *Gloceſterſhire*, was in divers Pariſhes conſiderably great; and remaining about 300 years in their poſſeſſion. & Mr. *Cambden* writes ſo much; as alſo *William* of *Malmeſbury* who lived 600 years ſince. But at length *Gaſcony* coming into the hands of the *Engliſh*, from whence cometh the moſt of the *ſtrong French Wine*, call'd *High-Country-wine*, and cuſtoms being ſmall, *wine* was imported into *England* from thence, better and cheaper then we could make it, and it was thought convenient to diſcourage *Vineyards* here, that the greater trade might be driven with *Gaſcoine*, and many ſhips might find imployment thereby.

Some Aſtrologers have conceited, that the Earth being grown older, and therefore colder hath cauſed the Sun to deſcend many thouſand miles lower to warm and cheriſh it, and one Argument which they bring for this opinion is, that *Vines* and *Silk-worms* are found in thoſe Countreys, wherein former times they were unknown: But if theſe fond men had conſidered the good *Husbandry* in theſe times, with the bleſſing of God on it, they had not run into ſuch fooliſh imaginations. This is true indeed, that the *Roman* Souldiers, who had *Alſatia* given them to live in, which is one of the beſt and moſt Southern places of *Germany*, mutined, becauſe they thought it ſo *cold*, that *Vines* would not grow there, & that therefore they ſhould be deprived of that delectable liquour; whereas we find at this preſent day *Vines* flouriſhing many hundred miles more toward the North, both in *France*, *Lorain*, &c. and *Germany*; and that they are crept down even to the *Latitude* of *England*. for the *Rheniſh-wines* grew within a degree of the Weſt-Southern places of this Iſle, and *Paris* is not two degrees South of us, yet *Vines* grow threeſcore miles on this ſide *Paris*, as by *Beaumont*, *Beauvais*, &c. by the way of *Picardy* near 20 leagues; as alſo by the way of *Pontoyſe* through *Normandy*, at *Artes*, 35 leagues from *Paris*, and 5 from *Diep*; yea the *Vines* of theſe places are the moſt delicate; for what wine is preferred before the Neat *Rheniſh* for Ladies, and at Table; and truely in my opinion, though I have travelled twice through *France*; yet no *wine* pleaſed

pleaſed me like *Vin D'ache*, and of *Paris* eſpecially about *Rueill*, which is a very fine *brisk Wine*, and not *fuming* up to the head, and *Inebriating* as other *Wines*: I ſay therefore that it is very probable, that if *Vines* have ſtept out of *Italy* into *Alſatia*, from them to theſe places, which are even as far North as *England*, and yet the *Wines* there are the moſt delicate, that they are not limited and bound there. For an hundred miles more or leſſe cauſeth little alteration in heat or cold, and ſome advantages which we have will ſupply that defect. But not to inſiſt too long on *probabilities*, I ſay, that here in *England* ſome *Ingenious Gentlemen* uſually make *Wine* very good, long laſting, without extraordinary labour and coſts. To inſtance in one, who in Great *Chart*, in the *Wilde* of *Kent*, a place very moiſt and cold, yearly maketh 6 or 8 Hogſheads, which is very much commended by divers who have taſted it. and he hath kept ſome of it two years, as he himſelfe told me, and hath been very good: Others likewiſe in *Kent* doe the ſame: and lately in *Surrey* a *Gentlewoman* told me, that they having many *Grapes*, which they could not well tell how to diſpoſe of, ſhe, to play the good *Houſe-Wife*, ſtampt them to make *verjuice*; but two months after drawing it forth, they found it very fine *brisk-Wine*, clear like *Rock-Water*, and in many other places ſuch *experiments* have been made. I therefore deſire *Ingenious* men to endeavour the raiſing of ſo neceſſary and pleaſant a commodity: eſpecially when *French-Wine* is ſo dear here, and I ſuppoſe is likely to be dearer; I queſtion not, but they ſhall find good profit and pleaſure in ſo doing, and that the *State* will give all encouragements to them: and if the *French Wine* pay *Excize* and *Cuſtoms*, and the *Wines* here be *toll-free*, they will be able to afford them far cheaper, then the *French* can theirs, and ſupply the whole *Iſle*, if they proceed according to theſe *Rules*.

Sir *Peter Ricard.*

Captain *Tucker.*

1. To chooſe the beſt ſorts of *Grapes*, which are moſt proper for this *Iſle*, and though there are many ſorts of *Grapes* amongſt *Gardiners*, yet I commend four ſorts eſpecially to them; and I deſire that they be very carefull in this particular: for it is the foundation of the work; if you fail in this, you fail

fail in all; for I know that *Burdeaux-Vines*, which bear very great *Grapes*, make *verjuice* onely at *Paris*, and that the tender *Orleans-Vine* doth not thrive there.

The firſt ſort is the *Parſely Vine*, or *Canada-grape*; becauſe it firſt came from thoſe parts, where it grows naturally; and though the Countrey be intolerably cold; yet even in the woods without manuring, it ſo far ripeneth his fruits, that the *Jeſuits* make *wine* of it for their Maſs; and *Racinè* (which is the *Juice* of the *Grape* newly expreſt, and boiled to a *Syrupe*, and is very ſweet and pleaſant) for their Lent-proviſion, as you may read in their *Relations*: and this *Vine* ſeemeth to be made for theſe Northern Countreys, becauſe it hath its leaves very ſmall and jagged, as if it were on purpoſe to let in the Sun, and it ripeneth ſooner then other *Grapes*, as I have obſerved in *Oxford-Graden*.

2. Sort of *Vine* is the *Rheniſh-Grape*; for it groweth in a temperate Countrey, not much hotter in the Summer then *England*; and the *Wine* is excellent as all know.

3. Sort is the *Paris-grape*; which is much like the temper of *England*, onely a little hotter in Summer: this *Grape* beareth a ſmall bunch cloſe ſet together, very hardly to endure *froſts*, and other *inconveniences*, and is ſoon ripe; ſo that the *Vintage* of *Paris*, is ſooner ended then that of *Orleans* or *Burdeaux*; and though it be not ſo delicate to the taſte, as ſome other *Grapes*: yet it maketh an excellent briſk *Wine*.

4. Sort is the *ſmall Muſkadell*; which is a very fine pleaſant *Grape*, both to eat, and to make *wine*. In *Italy* it uſually groweth againſt their houſes walls, and of this they make a ſmall pleaſant *Wine*, a Month or two before the ordinary *Vintage*. It is a tender plant in reſpect of the other *Vines* in the fields: theſe *Vines* I know are the moſt convenient for this Iſle; becauſe they bear ſmall bunches, and *Grapes* ſoon ripen, and are hardy to endure froſts and ill weather.

2. To chooſe convenient places. For this end, I counſel them, Firſt, to plant *Vines* on the South-ſide of their *dwelling Houſes*, *Barns*, *Stables*, and *Out-houſes*. The *Gentleman* of

Kent, whom I mentioned before, uſeth this courſe: and to keep the *Vines* from hurting his tiles, and that the wind may not wrong his *Vines*, he hath a frame made of poles, or any kind of wood, about a foot from the tiles, to the which he tyeth the *Vines*; by this means his *Vines* having the reflection of the yard, ſides of the houſes, and tiles do ripen very well, and bear much; ſo that one old *Vine*, hath produced nigh a Hogſhead of *Wine* in one year: and I wiſh all to take this courſe; which is neither chargeable, nor troubleſom, but very pleaſant; and if all in this *Iſland* would do thus, it's incredible, what abundance of *Wine* might be made, even by this petty way.

2. If that any *Gentleman* will be at the charge of making a *Vineyard*, let him chooſe a fine ſandy warm hill, open to the *South-Eaſt*, rather then to the *South-Weſt*: for though the *South-Weſt* ſeemeth to be hotter; yet the *South-Eaſt* ripeneth better, as I have ſeen in *Oxford Garden*; becauſe the *South-Eaſt* is ſooner warm'd by the Sun in the morning; and the *South-Weſt* winds, are the winds which blow moſt frequently, and bring raine, which refrigerate the plants: and ſuch a place is very requiſite; for in other places *Vines* do not thrive, even in *France*: for if you travel betwixt *Paris* and *Orleans*, which is above 30 leagues, yet you ſhall ſcarcely ſee a *Vineyard*, becauſe it is a plain Champion-Countrey. So likewiſe betwixt *Fontarabia* to *Burdeaux*, in the Southern parts of *France*, for an hundred miles together; becauſe the Land is generally a barren ſandy Plain, where only *Heath* abounds, and *Pine-trees*, out of which they make *Turpentine* and *Rozen*, by wounding of them; and *Tar* and *Pitch*, by the burning of them: and if any find ſuch a fine warm hill, and do dung and fence it well, he hath a greater advantage of moſt of the *Vineyards* of *France* by this conveniency, than they have of our *Iſle*, by being an hundred miles more South; for moſt of their *Vineyards* are in large fields not encloſed, on land that is ſtony, and but indifferently warm. But ſome will ſay, that wet weather deſtroyes us. It's true, that the wet will deſtroy all things; *Sheep*, *Corn*, &c. yet no man will ſay, that

that therefore *England* will not produce and nouriſh theſe Creatures; and if extraordinary wet years come, they ſpoil even the *Vines* in *France*: but take ordinary years and our moiſture is not ſo great, (though ſome abuſe us, and call *England Matula Cœli*) but the *Vines*, eſpecially thoſe I have mentioned before, will come to ſuch perfection as to make good *wine*: and if extraordinary rains fall: yet we may help the immaturity by *Ingennity*, as I ſhall tell you anon: or at worſt make *vineger* or *verjnice*, which will pay coſts.

Further theſe advantages we have of *France*.

1. This *Iſle* is not ſubject to nipping froſts in *May*, as *France* is; becauſe we are in an *Iſle*, where the Aire is more groſs then in the *Continent*; and therefore not ſo piercing and ſharp, as it plainly appeareth by our *Winters*, which are not ſo ſharp as in *Padua* in *Italy*: neither are we ſubject to ſuch ſtorms of *hail* in *Summer*, which are very frequent in *hot Countreys*, and for many miles together do ſpoil their *Vines*, ſo that they cannot make *Wine* of the *Grapes*; for thoſe *Grapes* which are touched by the *hail*, have a *Sulphureous* and a very unpleaſant taſte, and onely fit to make *Aqua-vitæ*. Further, Sometimes in *France*, cask for their *Wines* is ſo dear, that a *tun* of *Wine* may be had for a *tun* of *cask*: and the *cuſtome* and *excize* which is laid on *Wines* here, is as much again as the poor *Vigneron* in *France* expects for his *wine*. Not to ſpeak of the ill managing of their *Vines*, eſpecially about *Paris*, where poor men uſually hire an Acre or 2 of *Vines*, which they manage at their ſpare hours, and moſt commonly pack in ſo many plants of *Vines* on their ground, for to have the greater increaſe, that the ground and *Vines* are ſo ſhaded by one another, that I have wondered, that the Sun could dart in his beams to mature them; and therefore I cannot but affirm again, that we may make abundance of *Wine* here with profit, the charges of an Acre of *Vineyard* not being ſo great as of *Hops*: an hundred ſets well rooted, at *Paris* coſt uſually but 4 or 6 *Sous* or pence, where I have bought many: 2000 will plant an Acre very well: 50 s. a year is the ordinary rate for the three diggings with their *crooked Inſtrument* called *Hoyau*, and

the increaſe uſually four tuns for an Acre, which will be profit enough: and though I refer all to *Bonovil*, and others, who have written of the *manag i g of Vines*; yet I counſel to get a *Vigneron* from *France*, where there are plenty, and at cheaper rates than ordinary ſervants here, and who will be ſerviceable alſo for *Gardening*.

2. I will briefly tell what I have ſeen. In *Italy* through all *Lombardy*, which is for the moſt part plain and *Champian*, their *Vines* grow in their *Hedges* on *Walnut-trees*, for the moſt part: in which fields, they ſpeak of three Harveſts yearly, *viz.*

1. *Winter-Corn*, which is reaped in *June*, &c.

2. *Vines* and *Walnuts*, which are gathered in *September*.

3. Their *Summer-Grains* as *Millet*, *Panicle*, *Chiches*, *Vetches*, &c. *Buck-Wheat*, *Frumentone*, or that which we call *Virginia-Wheat*, *Turneps*, which they ſowe in *July*, when their *Winter-Corn* is cut and reaped, they reap in *October*. In *France*, their *Vines* grow three manner of wayes; In *Provence* they cut the *Vine* about two foot high, and make it ſtrong and ſtubbed, like as we do our *Oſiers*; which ſtock beareth up the branches without a *prop*.

2. About *Orleans*, and where they are more curious, they make frames for them to run along.

3. About *Paris* they tye them to ſhort poles, as we do hops to long ones. In *France* they uſually make trenches, or ſmall ditches, about three or four foot from one another, and therein plant their *Vines*, about one foot and an half deep, which is a good way, and very much to be commended; but if we here in *England*, plant *Vines* as we do hops, 4 or 5 foot diſtant, it will do very well, but let them not be packt together too thick, as they do in *France* in many places, leſt they too much ſhade the ground, and one another. In *Italy* when they tread their grapes with their feet in a Cart, they pour the juice into a great Veſſel or Fat, and put to it all their husks and ſtones which they call *Graſpe*, and let them *ferment*, or (as we ſay) *work* together 12 or 14 days, and uſually they put one third of water to it, this maketh a *wine* leſs furious, *Garbo* or rough, and therefore a good

ſto-

ſtomack-*wine*; but it ſpoileth the colour, and taketh away the pleaſant brisk taſte. In *France* ſo ſoon as they have preſſed out their liquour with their feet, they put it in hogſheads, and after in their Preſſe ſqueeze out what they can, out of the *Graſpe*; which ſeemeth to fill up their Hogſheads while they work, which is uſually three or four dayes, and then ſtop them cloſe: this is alſo the way uſed in *Germany*, and is the beſt, for it maketh a fine Gentile *wine* with a curious colour. In *Germany*, when their *Grapes* are green, they make fire in their Sellars in Stoves, by the which means, their *Wines* work extraordinarily, and do digeſt themſelves the better: This courſe we muſt alſo take here in *England* ſome years; for it helpeth the rawneſſe of all liquours very much. There is an *Ingenious Dutchman*, who hath a Secret, which as yet he will not reveal, how to help *Maturation* by a *Compoſt* applyed to the roots: The *Compoſt* which I have ſpoken of before, made of *Brimſtone*: *Pigeons-dung* is very excellent for that *purpoſe*, as alſo *Lees of* Wine, *blood*, *lime* uſed with moderation. He alſo knoweth how to make *ſour Grapes* produce *good wine*; I *ſuppoſe* his way to be this. Firſt, all juice of *Grapes* newly expreſſed is ſweet, and which may by it ſelfe alone be made into a *ſweet ſyrup*, by boiling, which the *French* call *Racincè*. Further in the *Evaporation* of *liquors*, which have not *fermented* or wrought, the watery part goeth away firſt. *Glauber.*

3. *Fermentation* giveth a *vinous* taſte, and maketh a liquour full of ſpirits.

You may then eaſily gueſs at the way, and perhaps he may adde alſo *ſugar* and *ſpices*, as the *Vintners* do when they make *Hippocras*. I know a *Gentleman*, who hath made excellent *wine* of *Raiſins* well boiled in water, and afterward fermented by it ſelf, or with Barm, it's called uſually *Meade*. I likewiſe know, that all ſweet and fatty *Juices* will make fine *vinous liquours*, as *Damſins*, if they be wrought or fermented ingeniouſly: but whoſoever goeth about ſuch experiments, let him not think that any thing is good enough for theſe purpoſes; but let him uſe the beſt he can get: for of naughty *corrupt* things, who can expect that which is excellent and delicate.

The eight Deficieny concerning Hemp and Flax.

The *Deficieney* of us in this kind is ſo obvious, that all the world takes notice of it, and it is (next the neglect of *fiſhing*) the greateſt ſhame to this Nation: for all know that we have as good land for theſe ſeeds, as any can be found in *Europe*; and that the ſowing of them requireth neither more labour, coſt, or skill, then other ſeeds. And further that the Materials made from theſe are extreamly neceſſary: for how miſerable ſhould we be without *Linnen*, *Canvaſes*, *Cordage*, *Nets?* How can we put our *ſhips* to Sea, which are the bulwarks of this *Iſle?* And yet we are neceſſitated to have theſe Commodities from thoſe who would deſtroy (I will not ſay the Nation, but I may boldly ſay) our *Shipping*, and *Trade*. I hope that this will more ſeriouſly be conſidered by thoſe at the *Helme* of our *State*. I will freely and plainly relate, how this *Deficiency* may eaſily be *remedied* according to my judgment.

1. To compel by a Law, that all *Farmers*, who plough and ſow 50 or 100 Acres of Land, ſhould ſow half an Acre, or an Acre of *Hemp* or *Flax*, or to pay 5 s. or 10 s. to the poor of the Pariſh where they live, or ſome Law to this purpoſe; for there is no man but hath land fit for one of theſe; *Hemp* deſiring a ſtiff, deep, rich land, *Flax* that which is light.

For there is ſo much irrationality in ſome profeſſions, that they muſt be forced even like Bruits to underſtand their own good. In King *Edward* the ſixth days ſomething was enacted to this purpoſe, as I am informed. In *Henry* the eighth days, there was a Law enacted that every man ſhould ſow his lands, and that no man ſhould encloſe his lands, leſt he ſhould turn it to *Paſture*; for we have had great dearth in *England* through the neglect of *Tillage*; which Laws even as yet ſtand in force; yet there is not, nor needeth there be any force to compel men to till and ſow their lands; for they have at length found the ſweetneſſe, and willingly go about it for their own profits ſake, and now we ſuppoſe (and not without cauſe) that *Encloſing* is an *Improvement*: and ſo concerning *Hemp* and *Flax*; I ſay, if they were once accuſtomed to ſow them, they would never leave it, as I ſee *Farmers* do in *Eaſt-Kent*; ſcarce

ſcarce a man but he will have a conſiderable plot of ground for *Hemp*, and about *London* far greater quantities of *Flax* is ſown then formerly.

2. It were convenient, that every Pariſh through the Nation ſhould have a ſtock to ſet their poor to work, that the young children and women might not run up and down idle, and begging or ſtealing (as they do in the *Countrey*) of *Apples*, *Peaſe*, *Wood*, *Hedges*, and ſo by little and little, are trained up for the *Gallows*.

3. That a ſevere Law ſhould be enacted againſt thoſe who run up and down and will not work: for if all know, that they may have work at home, and earn more within doors honeſtly, then by running roguing up and down, why ſhould they not compel them to it? And though ſome may think the Pariſhes will loſe much by this way; becauſe that the ſtock wrought will not be put off, but with loſſe, as perhaps 10 l. will be brought to 8 l. yet let them conſider how much they ſhal ſave at their doors, how many inconveniences they are freed from; their hedges in the Countrey ſhall not be pulled, their fruits ſtoln, nor their Corn purloined; and further, that the poor will be trained up to work, and therefore fit for any ſervice: yea and in their youth, learn a calling by the which they may get an honeſt livelyhood; and I dare ſay, their Aſſeſſements for the poor, would not be ſo frequent, nor the poor ſo numerous: and the benefit which redounds to the *Nation*, would be very great.

4. The charitable deeds of our forefathers, ought to be enquired after, that they be not miſplaced, as uſually they are, but be really beſtowed for the good of the poor, that are laborious, (as in *London* is begun) and if there be any that will not work, take Saint *Pauls* rule, who beſt knew what was beſt for them. I dare not adviſe to take it in part of *Commons*, *Fens*, &c. and to improve them for this uſe, leſt I ſhould too much provoke the rude mercileſſe multitude. But to return to my diſcourſe. I ſay, that ſowing *Hemp* and *Flax*, will be very beneficial.

1. To the Owners of Land: for men uſually give in divers pla-

places 3 l. *per* Acre, to ſow *Hemp* and *Flax* (as I have ſeen at *Maidſtone* in *Kent*, which is the only place, I know in *England* where *thread* is made: and though nigh an hundred hands are imployed about it; yet they make not enough for this *Nation*) and yet get good profit. How advantageous will this be to thoſe who have drained the *Fens*, where queſtionleſſe *Hemp* will flouriſh, and exſiccate the ground: for *Hemp* deſireth ſtiff moiſt land, as *Flax* light and dr[illegible]) and likewiſe to thoſe in the North of *England*, where land is very cheap? I hope in a little time *Ireland* will furniſh us with theſe commodities, if we be idle; for there land is very cheap, and thoſe ſeeds need no inincloſure; for Cattle will not touch them, except Dear, neither doth it fear the plunderer, either in the field or barn.

2. It's profitable to the ſower. I know that they uſually value an Acre at 10 or 12 l. which coſteth them uſually but half the money. Whether there be *Flax* that will yeild 30 or 40 l. *per* Acre as ſome report, I know not.

3. To the place where it is ſown; becauſe it ſets many poor to work. I wiſh it were encouraged more in the North than it is; becauſe there are many poor, who could willingly take pains, and though *ſpinning of linnen* be but a poor work; yet it is light, and may be called *Womens recreation*, (and in *France* and *Spain*, the *beſt Citizens wives* think it no diſgrace to go about *ſpinning* with their *Rocks*) and though in ſome part the poor think it nothing to earn 4 or 6 d *per* day, and will as ſoon ſtand with their hands in their pockets, as work cheap; yet in the North they account it well to earn 3d. or 4d. by *ſpinning*, which they may do.

Laſtly, It would be very beneficial to this *Nation*, and ſave many thouſand pounds, I may ſay 100 thouſands, which are expected either in caſh, or good commodities; and we ſhould not be beholding to *Holland* for *fine linnen* and *Cordage*, nor to *France* for *Poldavices*, *Locrams*, *Canvaſes*, *Nets*, nor to *Flanders* for *thread*: but might be ſupplyed abundantly with theſe neceſſary commodities even at our own doors.

There is no ſmall *Deficiency* in dunging and manuring lands, both becauſe all that manner of manuring and amending lands,

is

is not known to every one, and alſo that they do not imploy all they know to the beſt uſe. I will therefore ſet down moſt of the wayes I have ſeen here in *England* and *beyond Seas*, by which Land is improved, and the beſt wayes to uſe the ſame. 9. *Deficiency, concerning dunging and manuring Lands.*

1. To begin with *Chalk*, which is as old a way as *Julius Cæſars* time, as he himſelf reporteth in his *Commentaries*. *Chalk* is of two ſorts.

1. A *hard, ſtrong, dry Chalk*, with which in *Kent* they make walls, burn lime, and make whiting for houſes.

2. Kind is a *ſmall unctuous Chalk*: this is the *Chalk* for land, the other helpeth little; onely it maketh the Plough go eaſier in ſtiffe lands: broomy land is accounted the beſt land for *Chalke* and *Lime*, but it helpeth other lands alſo; eſpecially if you *Chalke* your ground, and let it lye a year or two, which is the way uſed in *Kent*; that it may be matured and ſhattered by the Sun and rain, otherwiſe if it be turned in preſently, it is apt to lye in great clods, as I have ſeen it twenty years after. *Chalk* alſo ſweetneth *paſture*, but doth not much increaſe it, and killeth *ruſhes* and *broom*.

2. *Lime*, which is made of divers ſorts of *ſtones*, is an excellent thing for moſt *Lands*, and produceth a moſt pure grain: 160 buſhels is uſually laid on an Acre, but I ſuppoſe that if men did lay but half the dung on the ground, as they uſually do, as alſo *Lime* and *Chalke*, and *Dung* and *Lime* it oftener, it would be better *Husbandry*: for much *dung* cauſeth much *weeds*, and cauſeth *Corn* to lodge; and too much *Chalk* doth too much force the land, ſo that after ſome good crops, it lyeth barren many years. It's good *Husbandry* likewiſe to lay down lands before they be too much out of heart; for they will ſooner recover: otherwiſe not.

3. *Ordinary Dung*, which every one knoweth; but let it not be expoſed to the Sun too much, nor let it lye in an high place: for the rain will waſte away it's fatneſs. It's obſervable, that earth the more it is expoſed to the Sun it's the better; as we ſee that land is much bettered by oft ploughings: for the Sun

and dew engender a *nitrous* fatneſſe, which is the cauſe of *fertility*; but dung is exhauſted by the Sun, as it appeareth by the *folding* of *ſheep*, which profit little, if it be not preſently turned in; therefore a *Sheph rd*, if his time would permit, ſhould turn up the ground with an How for to ſow *Turneps*, as *Gardiners* do for to ſow. I have ſeen *Ordinary Dung* on dry lands in dry years to do hurt, and it oft cauſeth weeds and trumpery to grow.

4. *Marle*, It's of divers kinds: ſome ſtony, ſome ſoft, ſome white, ſome yellowiſh, but moſt commonly blew. It's in moſt places in *England*, but not known by all: the beſt marks to know it, is to expoſe it to the Aire, and to ſee if the Sun or Rain cauſe it to ſhatter, and break in ſquare pieces like dice, and if it be *unctuous*, or rather to take a load or two, and lay it on the midſt of your fields, and to try how it mendeth your lands. It's excellent for *Corn* and *Paſture*, eſpecially on dry lands. In *Eſſex* the ſcouring of their ditches they call *Marle*, becauſe it looketh blew like it, it helpeth their lands well.

5. *Snaggrace*: which is a kind of earth taken out of the *Rivers*, full of ſmall ſhels. It helpeth the barren lands in divers parts of *Surrey*. I believe it's found in all *Rivers*; It were well, if in other parts of *England*, they did take notice of it.

6. *Owſe* out of Marſh ditches, hath been found very good for white *Chalky* land: as alſo *Sea-mud* and *Sea-Owſe* is uſed in divers parts of *Kent* and *Suſſex*.

7. *Sea-Weeds* of all ſorts rotted.

8. Mr. *Carew* in his *Survey* of *Cornwall* relateth, that they uſe a fat *Sea-ſand*, which they carry up many miles in ſacks, and by this they have very much improved their barren lands. It were worth the while to try all manner of *Sea-ſands*. for I ſuppoſe, that in other places they have a like *fertilizing* fatneſſe.

9. *Folding* of *Sheep*, eſpecially after the *Flanaders* manner, (*viz.*) under a covert, in which earth is ſtrawed about 6 inches thick, on which they ſet divers nights: then more earth muſt be brought and ſtrawed 6 inches thick, and the *Sheep folded*

folded on it, and thus they do continually *Winter* and *Summer*. I ſuppoſe a ſhepheard, with one horſe, will do it at his ſpare hours, and indeed ſooner then remove his *fold*; and this *folding* is to be continued, eſpecially in *Winter*, and doth the *ſheep* good; becauſe they lye warm and dry: and truly if I am not miſtaken, by this means we may make our *ſheep* to enrich all the barren dry lands of *England*.

10. *Aſhes* of any kind, *Sea-coale-aſhes* with *Horſe-dung*, the Gardiners of *London* much commend for divers uſes. It's great pitty, that ſo many thouſand loads are thrown into waſt places, and do no good.

11. *Soot* is alſo very good, being ſprinkled on *ground*, but it's too dear, if it be of *wood*: for it's worth 16 d. or 2 s a buſhel.

12. *Pigeons* or *Hens-dung* is incomparable: one load is worth 10 loads of other *dung*, & therefore it's uſually ſown on *Wheat*, that lyeth afar off, and not eaſie to be helped: it's extraordinary likewiſe on a *Hop-Garden*.

13. *Mault-duſt* is exceedingly good in *Corn-land*: *blood* for *trees*; alſo *ſhavings of horns*, which are carried many miles from *London* for this purpoſe, as alſo the duſt of mault.

14. Some commend very much the *ſweeping* of a *ſhip* of *ſalt*, or *droſſy ſalt* and *brine*: it's very probable; becauſe it killeth the worms, and all *fertility* proceedeth from *ſalt*. At *Nantwich*, they uſe the droſs or refuſe of *ſalt* for their Meadows with very good ſucceſs.

15. I have ſeen in *France*, poor men cut up *Heath*, and the *Turf* of the ground, and lay them on an heap, to make *mould* for their barren lands. *Brakes* laid in a moiſt place, and rotted, are uſed much for *Hop-Grounds*, and generally all things that will rot, if they were ſtones, would make *dung*.

16. In *New-England* they *fiſh* their ground, which is done thus: In the *ſpring* about *April*, there cometh up a *fiſh* to the freſh *Rivers*, called an *Alewife*; becauſe of its great belly: and is a kind of *Shade*, full of bones; theſe are caught in wiers, and ſold very cheap to the Planters, who uſually put one or two cut in pieces into the hill where their Corn

is planted, called *Virginia-Wheat*, for they plant it in hills, 5 Grains in an hill, almoſt as we plant *Hops*, (in *May*, or *June*: for it will not endure Froſts) and at that diſtance; it cauſeth fertility extraordinary for two years, eſpecially the firſt: for they have had fifty or ſixty buſhels on an Acre, and yet plough not their Land, and in the ſame Hills doe plant the ſame Corn for many years together, and have good Crops: beſides abundance of *Pompions*, and *French* or *Kidney beans*. In the North parts of *New-England*, where the fiſher men live, they uſually *fiſh* their Ground with *Cods-heads*; which if they were in *England* would be better imployed I ſuppoſe that when *ſprats* be cheap, men might mend their *Hop-grounds* with them, and it would quit coſt: but the *dogs* will be apt to *ſcrape* themup, as they do in *New-England*, unleſs one of their legs be tyed up.

17. *Urine.* In *Holland* they as carefully preſerve the *Cowes Urine*, as the *Dung* to enrich their land: old *Urine* is excellent for the *Roots* of *Trees*. *Columella* in his Book of *Husbandry*, ſaith, that he is an ill Husband that doth not make ten loads of dung for every great beaſt in his yard, and as much for every one in his houſe, and one load for ſmall Beaſts as *Hogs*. This is ſtrange Husbandry to us: and I believe there are many ill Husbands by this account. I know a woman who liveth five miles South of *Canterbury*, who ſaveth in a paile all the droppings of the Houſes, I mean the *Urine*, and when the paile is full, ſprinkleth it on her *Meadow*, which cauſeth the graſs at firſt to look yellow, but after a little time it grows wonderfully, that many of her Neighbours wondred at it, and were like to accuſe her of Witchcraft.

18. *Woollen-rags*, which *Hartfort-ſhire* men uſe much, and *Oxford-ſhire*, and many other places: they do very well in thin *Chalky* Land in *Kent* for two or three years. It's a fault in many places, that they neglect theſe, as alſo *Linnen rags*, or *Ropes-ends*, of the which white and brown paper is made; for it's ſtrange that we have not *Linnen-rags* enough for paper, as other Nations have; but muſt have it from *Italy*, *France*, and *Holland*.

19. *Den-*

15. *Denſhiring* (ſo called in *Kent*, where I onely have ſeen it uſed, though by the word it ſhould come from *Denbighſhire*,) is the cutting up of all the *Turffe* of a *Meadow*, with an inſtrument ſharp on both ſides, which a man with violence thruſts before him, and then lay the *Turff* on heaps, and when it is dry they burn it, and ſpread it on the ground. The Charge is uſually four Nobles, which the goodneſſe of a Crop or two repayeth. *Mr. Cabden.*

20. *Mixture* of Lands. *Columella* an old Writer ſaith, that his Grandfather uſed to carry ſand on clay, and on the contrary to bring clay on ſandy grounds, and with good ſucceſs, the Lord *Bacon* thinking much good may be done thereby; for if *Chalk* be good for loamy land, why ſhould not loam be good for *Chalky* banks? *Natural Hiſtory,*

21. I may adde *Encloſure* as an *Improvement* of land: not onely becauſe that men, when their grounds are encloſed, may imploy them as they pleaſe; but becauſe it giveth warmth, and conſequently *fertility*. There is one in *London*, who promiſed to mend lands much by warmth onely, and we ſee that if ſome few ſticks lye together, and give a place warmth, how ſpeedily that graſſe will grow.

22. *Steeping* of *Grains*. The *Ancients* uſed to ſteep *Beans* in ſalt-water: and in *Kent* it's uſuall to ſteep *Barley*, when they ſow late, that it may grow the faſter; and alſo to take away the ſoil: for wild *Oats*, *Cockle*, and all ſave *Drake* will ſwim: as alſo much of the light Corn, which to take away is very good. If you put *Pigeons-dung* into the water, and let it ſteep all night, it may be as it were half a dunging: take heed of ſteeping *Peaſe* too long; for I have ſeen them ſprout in three or four hours.

23. Is the *ſowing of Courſe* and cheap Grain, and when they are grown to plough them in. For this purpoſe the *Ancients* did uſe *LUPINES*, a Plant well known to our *Gardiners*: and in *Kent* ſometimes *Tares* are ſowen, which when the Cattel have eaten a little of the tops, they turn them in, with very good *Improvement* for their ground.

Laſtly, To conclude, I may adde as a main Deficiency, that though we by experience find that all the foreſaid Materials, and divers others, as oft-tilling, Husbandry, ſeaſons, &c. change of Seed and Land, reſting of Lands, fencing, &c. do cauſe Fertility: yet we are very ignorant of the true cauſes of Fertility, and know not what Chalk, Aſhes, Dung, Marle, Water, Air, Earth Sun, &c. do contribute: whether ſomething Eſſential, or Accidental; Material, or Immaterial; Corporal, or Spiritual; Principal, or Inſtrumental; Viſible, or Inviſible? whether Saline, Sulphureous, or Mercurial; or Watry, Earthy, Fiery, Aereal? or whether all things are nouriſhed by Vapours, Fumes, Atoms, Effluvia? or by Salt, as Urine, Embrionate, or *Non ſpecificate?* or by Ferments, Odours, Acidities? or from a *Chaos*, or inconfuſed, indigeſted, and unſpecificated lump? or from a Spermatick, dampiſh Vapour, which aſcendeth from the Centre of the Earth, or from the Influence of Heaven? or from Water onely impregnated, corrupted, or fermented? or whether the Earth, by reaſon of the Divine Benediction hath an Infinite, multiplicative Vertue, as Fire, and the Seeds of all things have? or whether the multiplicity of Opinions of learned *Philoſophers*, (as *Ariſtotle*, *Rupeſc. Sendivog. Norton*, *Helmont*, *Des Cartes*, *Digby*, *White*, *Plat*, *Glauber*,) concerning this Subject ſheweth the great difficulty of this Queſtion, which they at leaſure may peruſe. I for my part pare not venture on this vaſt Ocean in my ſmall Bark, leſt I be ſwallowed up; yet if an opportunity preſents, ſhall venture to give ſome hints, that ſome more able Pen may engage in this difficult Queſtion, which ſtrikes at the Root of Nature and may unlock ſome of her choyceſt treaſures. The Lord *Bacon* hath gathered ſtubble (as he ingeniouſly and truly affirms) for the bricks of this foundation; but as yet I have not ſeen ſo much as a ſolid foundation; plainly laid by any, on which an ingenious man might venture to raiſe a noble Fabrick: I acknowledge the burthen too heavy for my ſhoulders.

I will not deny, but that we have good *Husbands*, who *dung* and *Marle* their *Meadows*, and *Paſture-land*, and throw down all *Mole* and *Ant-hills*, and with their *Spud*-ſtaffe, cut up all thiſtles and weeds; and that they likewiſe ſtraw *Aſhes* on their Grounds to kill the *Moſſe*; and *ſalt* for the *Worme*s, and they doe very well, but yet there are many who are negligent in theſe particulars, for the which they are blame-worthy, but the *Deficiencies*, of which I intend to ſpeak of, are theſe following. *Cato*, one of the wiſeſt of the *Romans*, ſaith, that *Pratum eſt, quaſi paratum*; alwayes ready, and prepared; and preferreth *Meadows* before the *Olive-Gardens*, (although the *Spaniards* bequeath *Olive-trees* to their children, as we do cottages) or *Vines* or *Corn*; becauſe *Meadows* bring in a certain profit, without labour and pains. But the other requireth much coſt and paines, and are ſubject to *Froſts*, *Mildew*, *Haile*, *Locuſts*: to the which for the honour of *Meadows* I may adde that the ſtock of *Meadows*, is of greater value, and the Commodities which ariſe from them, are divers; and of greater value, then Corn, as *Butter*, *Cheeſe*, *Tallow*, *Hides*, *Beef*, *Wool*: and therefore I may conclude, that *England* abounding in *Paſtures* more then other *Countreys* is therefore richer; and I know (what others think I care not) that *France*, Acre for Acre, is not comparable to it; *Forteſcue Chancelour* of *England*, ſaith, that we get more in *England* by ſtanding ſtill, then the *French* by working: but to ſpeak of the *Deficiencies* amongſt us.

10. *Deficiency cōcerning the Non-improvement of our Meadows.*

1. We are to blame, that we have neglected the great *Clover-graſs*, *Saint Foine*, *Lucerne*.

2. That we do not floate our lands, as they do in *Lumbardy*, where they mowe their Lands three or four times yearly, which conſiſt of the great *Clover-graſs*. Here are the excellent *Parmiſane Cheeſes* made, and indeed theſe *Paſtures* far exceed any other places in *Italy*, yea in *Europe*. We here in *England* have great opportunities by Brookes and Rivers in all places to do ſo, but we are *negligent*; yet we might [illegible] ble, if not treble our profits, kill all ruſhes, &c. But I deſireth to know the manner how to do this, and that

that will ariſe thereby, let him read Mr. *Blithes* Book of *Huſbandry* lately printed.

3. That when we lay downe Land for *Meadow* or *Paſture*, we doe not ſowe them with the Seeds of fine ſweet graſſe, *Trefoils*, and other excellent *herbs*. Concerning this you may read a large *Treatiſe* of the *Country-Farmer*; for if the Land be rich, it will put forth *weeds* and trumpery, and perhaps a kind of ſoure graſſe little worth, if it be poor, ye ſhall have thiſtles, *May-weed*, and little or no graſſe, for a year or two. I know a Gentleman, who at my entreaty, ſowed with his *Oats* the bottome of his *Hay-mow*, and though his Land were worne out of heart, and naturally poor; yet he had that year not onely a Crop of *Oats*; but he might if it had pleaſed him, have mowen his graſſe alſo, but he ſpared it, which was well done, till the next year, that it might make a *Turffe*, and grow ſtronger. By this *Husbandry* Lands might be well improved, eſpecially if men did conſider the diverſity of graſſes, which are ninety ſorts, and three and twenty of *Trefoil*: I know a place in *Kent*, which is a white *Chalky Down*, which ground is ſometimes ſown with Corn a year or two, and then it reſteth as long or longer: when it is laid down, it maintaineth many great *Sheep* and very luſty, ſo that they are even fit for the *Butcher*; and yet there doth ſcarce appear any thing that they can eat, which hath cauſed divers to wonder, as if they had lived on *Chalk-ſtones*: but I more ſeriouſly conſidering the matter, throughly viewed the ground, and perceived that the ground naturally produceth a ſmall *Trefoil* which it ſeemeth is very ſweet and pleaſant; it's commonly called *Trifolium luteum*, or *Lupilinum*, that is, *yellow*, or *Hop-Trefoil*: and I am perſwaded, if that the Seed of this *Trefoil* were preſerved, and ſowne with *Oates*, when they intend to lay it down, it would very much advance the *Paſture* of that place; therefore I deſire all *Ingenious* men, ſeriouſly to conſider the nature of the *Trefoils*, which are the ſweeteſt of graſſes, and to obſerve on what grounds they naturally grow: and alſo the nature of other graſſes, which (as I have ſaid before) are no leſs then ninety ſorts, naturally growing in this Iſle; ſome on wa-

watry places, ſome on dry, ſome on clay, others on ſand, chalk, &c. Some on fruitful places, others in barren; by the which means, I ſuppoſe a ſolid foundation might be laid, for the advancing of *Paſture*-lands of all ſorts, through this *Iſland*? for I know ſome plants, as the *Orch* call'd *Bee-flower*, &c. which will thrive better on the *Chalky* barren banks, then in any Garden, though the Mould be never ſo rich and delicate, and the Gardiner very diligent in cheriſhing of it: and why may not the ſame propriety be in graſſes? for we ſee diverſe *benty* graſſes to thrive, eſpcially on barren places, where ſcarce any thing elſe will grow. I muſt again and again deſire all men to take notice of the wonderfull graſs which groweth near *Salsbury*, and deſire them to try it on their rich *Meadows*.

11. *Deficiency concerning Waſte Lands.*

It's a common ſaying, that there are more *waſte* lands in *England*, in many particulars, then in all *Europe* beſides, conſidering the quantity of land. I dare not ſay this is true; but hope if it be ſo, that it will be mended. For of late much hath been done for the advancement of theſe kinds of land; yet there are as yet great *Deficiencies*. In the times of *Papiſtry*, all in this *Iſland* were either *Souldiers* or *Scholars*: *Scholars* by reaſon of the great honours, priviledges, and profits, (the third part of the *Kingdom* belonging to them) and *Souldiers*, becauſe of the many and great Wars with *France*, *Scotland*, *Ireland*, *Wales*. And in thoſe times *Gentlemen* thought it an honour to be careleſſe, and to have *Houſes*, *Furniture*, *Diet*, *Exerciſes*, *Apparel*, &c. yea all things at home and abroad, Souldier-like: *Muſick*, *Pictures*, *Perfumes*, *Sawces*, (unleſſe good ſtomacks) were counted, perhaps unjuſtly, too effeminate. In Queen *Elizabeth's* dayes, *Ingenuities*, *Curioſities*, and *Good Husbandry*, began to take place, and then *Sale-Marſhes* began to be fenced from the Seas; and yet many were neglected, even to our dayes, as *Holhaven* in *Eſſex*, *Axtel-holme Iſle*, nigh *York-ſhire*: many 1000 of Acres have lately been gained from the Sea in *Lincolne-ſhire*, and as yet more are to be taken in there, and in other places. *Romſey-marſh*

marſh in *Kent*, conſiſting of 45000 Acres and upwards, (as *Cambden* relateth) is of ſome antiquity where the Land is uſually let 30 s. *per* Acre, and yet 1 d. *per* week conſtantly is payd, through the whole levil, for the maintenance of the wall, and now and then two-pence, whereas ordinary ſalts are accounted dear at five ſhillings or ſix ſhillings *per* Acre; ſo that the improvement is very conſiderable: the ſame I may ſay of *Fens*, eſpecially that great *Fen* of *Lincolnſhire*, *Cambridg*, *Huntingdon*, conſiſting as I am informed of 380000 Acres, which is now almoſt recovered; and a friend of mine told me very lately, that he had profered a Mark *per* Acre, for 900 Acres together, to ſowe *Rape* on, which formerly was ſcarcely valued at twelve pence *per* Acre; very great therefore is the improvement by draining of lands, and our negligence very great, that they have been waſt ſo long, and as yet ſo continue in divers places: for the improving of a Kingdom is better than the conquering of a new one.

2. I ſee likewiſe no ſmall faults in this land, by having ſo many *Chaſes* and *Forreſts*, where *Brambles*, *Brakes*, *Furzes* doe grow, when as theſe trumperies might be cut up, and pot-aſhes made of them; and the ground imployed profitably for *Corn* or *Paſture*. I know a *Forreſt* by *Brill* in *Buckinghamſhire* taken in, and the land is uſually let being now well encloſed, for 4 or 5 Nobles *per* Acre. In *Lancaſhire* alſo, as about *Lerpoole*, and elſewhere I have ſeen Commons little worth, advanced to a great price by *Marling*, &c.

3. Sort of *waſte-land*, is dry *heathy* Commons. I know that poor people will cry out againſt me, becauſe I call theſe *waſte-lands*; but it's no matter: I deſire *Ingenious Gentlemen* ſeriouſly to conſider, whether or no theſe lands might not be improved very much by the *Husbandry* of *Flaunders*, (*viz.*) by ſowing *Flax*, *Turneps*, great *Clover-graſs*, if that *Manure* be made by *folding Sheep* after the *Flaunders* way to keep it in heart?

2. Whether the *Rottenneſſe* and *Scabbineſſe* of Sheep, *Murrein* of Cattel, *Diſeaſes* of Horſes, and in general all diſeaſes

of

of Cattel doe not eſpecially proceed from *Commons*?

3. If the rich men, who are able to keep great ſtocks, are not great Gainers by them?

4. Whether *Commons* do not rather make poor, by cauſing idleneſſe, than maintain them; and ſuch poor, who are trained up rather for the Gallows or beggery, then for the Common-wealths ſervice?

5 How it cometh to paſs, that there are feweſt poor, where there feweſt *Commons*, as in *Kent*, where there is ſcarce ſix *Commons* in the *County* of a conſiderable greatneſſe?

6. How many do they ſee enriched by the *Commons*; and if their Cattel be not uſualy ſwept away by the *Rot*, or ſtarved in ſome hard Winters?

7. If that poor men might not imploy two Acres encloſed to more advantage; then twice as much in a *Common*?

And Laſtly, If that all *Commons* were encloſed, and part given to the Inhabitants, and part rented out, for a ſtock to ſet all the poor on work in every *County*; I determine nothing in this kind: but leave the determination for wiſer heads.

4. *Parks.* Although I cannot but reckon *Parks* amongſt Lands, which are not improved to the full; but perceive conſiderable *waſte* by them, by *brakes*, *buſhes*, *brambles*, &c. growing in divers places, and therefore wiſh there were fewer in this *Iſland*; yet I am not ſo great an enemy to them, as moſt are: for there are very great Uſes of them. As,

1. For the bringing up of young Cattel.

2. For the maintaining of Timber, ſo that if any have occaſion to uſe a good piece of Timber either for a Mil-poſt, or a Keel of a Ship, or other ſpecil uſes, whither can they go but to a *Park*?

3. The *Skins* of the *Deer* are very uſefull, and their *fleſh* excellent *Food*. Not to ſpeak of the *Medicinal Uſes*, nor of *Acorns* for Hogs, &c. But ſome will object that the Plough never goeth there. To the which I anſwer, It's no matter: For I cannot but ſay as *Forteſcue* Chancellor to *Henry* 6. doth,

Preheminence of Engliſh Laws.

That God hath given us ſuch a fruitful land, that without labour we have plenty: whereas *France* muſt dig and delve for what they have. And I ſuppoſe, that I could maintaine two things which are thought great *Paradoxes*, *(viz.)* that it were no loſſe to this *Iſland*, if that we ſhould not plough at all, if ſo be that we could certainly have Corn at a reaſonable rate, and likewiſe vent for all our *Manufactures* of *Wool*.

1. Becauſe that the Commodities from Cattel are far more ſtable then Corn: for *Cloths*, *Stuffs*, *Stockins*, *Butter*, *Cheeſe*, *Hides*, *Leather*, *Skins*, *Wool*, *Tallow*, are certaine even every where: Corne ſcarcely in any place, conſtantly in none.

2. *Paſture* imployeth more hands, which is the ſecond *Paradox*: and therefore *Paſture* doth not *depopulate*, as it is commonly ſaid: for *Normandy* and *Picardy* in *France*, where there are *Paſtures* in a good meaſure, are as populous as any part of *France*; and I am certaine, that *Holland*, *Friezeland*, *Zealand*, *Flaunders*, and *Lombardy*, which rely altogether on *Paſtures*, are the moſt populous places in *Europe*. But ſome will object and ſay, that a ſhepherd and a dog formerly hath deſtroyed divers Villages. To this I anſwer, that we well know what a ſhepherd and a dog can do, *(viz.)* look to two or three hundred ſheep at the moſt, and that two or three hundred Acres will maintain them, or the land is extreamly barren; and that theſe two or three hundred Acres being barren, will ſcarcely maintain a Plough, (which is but one man and two boyes,) with the horſes: and that the *mowing*, *reaping*, and *threſhing* of this Corne, and other Work about, will ſcarcely maintaine three more with work through the whole year. But how many people may be imployed by the *Wool* of two or three hundred *Sheep*, in *Picking*, *Sorting*, *Carding*, *Spinning*, *Weaving*, *Dying*, *Fulling*, *Knitting*, I leave to others to calculate. And further if the *Paſtures* be rich *Meadows*, and go on *dairing*, I ſuppoſe all know, that an hundred Acres of ſuch land imployeth more hands then 100 Acres of the beſt Corn-Land in *England*, and produceth likewiſe

wiſe better exportable Commodities. And further, if I ſhould grant, that formerly the ſhepherd and his dog did *depopulate*, that I may not condemn the wiſdom of former Ages; yet I will deny, that it doth ſo now: for formerly we were ſo unwiſe, as to ſend over our *Wool* to *Antwerp*, and other places, where they were *Manufactured*; by which means one pound oft brought ten *unwrought* to them; but we ſet now our own poor to work, and ſo ſave the *depopulation*. Yet I ſay, it's convenient to encourage the Plough; becauſe that we cannot have a certainty of Corn, and carriage is dear both by ſea and land, eſpecially into the *Inland-Countreys*, and our Commodities by *Wool* do cloy the Merchants.

5. *Ruſhy*-lands. *Blith* telleth us good Remedies for theſe *Inconveniences*, (*viz.*) *making deep trenches, oft-mowings, Chalking, Liming, Dunging* and *Ploughing*. I know where hungry gueſts Horſes ſoon make an end of them.

6. *Furze, Broom, Heath*, theſe can hardly be ſo deſtroyed, but at length they will up again; for God hath given a peculiar propriety to every kind of earth, to produce ſome peculiar kinds of Plants, which it will obſerve even to the Worlds end, unleſſe by *Dung, Marl, Chalk*, you alter even the very nature of the earth. In *Gallitia* in *Spaine*, where ſuch barren lands do very much abound, they do thus: firſt, they grub them up as clean as they can; of the greater Roots and Branches they make fire-wood; the ſmaller ſticks are either imployed in fencing, or elſe are burnt on the ground; afterwards the Land being ploughed twice at leaſt, they ſowe *Wheat*, and uſually the Crop is great, which the *Land-lord* and *Tenant* divide according to a compact; then the ground reſteth, and in three or four years, the *Furze* or *Brooms* will recover their former growth, which the painfull *Husbandman* grubbeth, and doeth with it as formerly. I ſet this down, that you may ſee how laborious the *Spaniard* is in ſome places, the poverty of the Countrey compelling him to it.

7. There are other *Inconveniences* in the Land, beſides weeds

and trumpery (*viz.*) *Ill Tenures*, as *Copy-hold*, *Knight-ſervice*, &c. ſo that the *Poſſeſſour* cannot cut any Timber down, without conſent of the *Lord*; and when he dyes muſt pay one or two years rent, perhaps more; becauſe there is no certaine Fine, but is at the Land-Lords mercy. But theſe are not in the power of the poor *Husbandman* to remedy; I therefore paſſe them by: yet hope that in little time we ſhall ſee theſe *Inconveniences remedied*: becauſe they much diſcourage *Improvements*, and are (as I ſuppoſe) *Badges* of our *Norman* ſlavery.

To conclude, It ſeemeth to me very reaſonable, and it will be a great encouragement to laborious men, to *improve* their barren lands, if that they ſhould have recompence for what they have done, according as indifferent men ſhould judg, when they leave it, as is the cuſtome in *Flaunders*.

12. *Deficiency, in Woods.* I have likewiſe obſerved ſome *Deficiencies* in *Woods*, which I ſhall briefly declare, with the beſt way to *remedy* the ſame.

1. It's a great *fault*, that *generally* through the *Iſland* the *Woods* are deſtroyed; ſo that we are in many places very much neceſſitated both for fuel, and alſo for timber for building, and other uſes; ſo that if we had *Coals* from *Newcaſtle*, and *Boards* from *Norwey*, *Clap-boards*, *Barrel-ſtaves*, *Wainſcot*, and *Pipe-ſtaves*, from *Pruſſia*, we ſhould be brought to great extremity: and many *Mechanicks* would be neceſſitated to leave their callings.

2. *Deficiency*, is that our *Woods* are not ordered as they ſhould be; but though *Woods* ſhould be eſpecially preſerved for timber, for building and ſhipping; yet at this time it's very rare to ſee a good *Timber-tree* in a *Wood*.

3. That many of our *Woods* are very thin, and not repleniſhed with ſuch ſorts of *Woods*, as are convenient for the place.

4. That we ſell continually, and never plant or take care for poſterity.

Theſe *Deficiencies* may be thus *Remedyed*.

1. To put in execution the *Statutes* againſt *grubbing of Woods*, which are ſufficiently ſevere. It's well known, we have good Laws;

Laws; but it's better known, they are not executed. In the *Wilde of Kent*, and *Suſſex*, which lies far from the *Rivers* and *Sea*, and formerly have been nothing but *Woods*, liberty is granted for men to grub what they pleaſe; for they cannot want firing for themſelves, and they are ſo ſeated, that neither fire-wood, nor timber can be tranſported elſewhere. I know a *Gentleman* who proffered there good *Oak-timber* at 6 s. 8 d. *per* tun, and the Land in thoſe parts in general is very good. About *Tunbridge* there is Land which formerly was *Wood*, is now let for 30 s. *per* Acre; ſo that to keep ſuch lands for *Wood*, would be both loſſe to the *owner*, and to the *Iſland*: But in other parts of the *Iſland* it is otherwiſe, and men are much to be blamed for deſtroying both timber and fuel. I have ſeen at *Shooters-hill* near *London*, ſome *Woods* ſtubbed up which were good ground for *Wood*, but now are nothing but *ſurze*, which is a great loſſe both to the *owner*, and to the *Country*. For the Land is made worſe then it was formerly. I conceive there are Lands, which are as naturally ordained for *Woods*, *viz. Mountainous*, *Craggy*, *uneven-land*, as *ſmall hills* for the *Vines* and *Olives*; *plain lands* for *Corn*; and *low moiſt lands* for *Paſture*: which lands if they be ſtubbed, do much prejudice the *Common-wealth*.

2. That all *Woods* ſhould have ſuch a Number of Timber-trees *per* Acre, according to the *Statute*. There is a good Law for that purpoſe, but men delude both themſelves and the law, that they every *Felling* cut down the *ſtanders*, which they left the *felling* before, leſt perchance they ſhould grow to be *Timber*, and leave twelve ſmall *Standers*, that they might ſeem to fulfil in ſome meaſure the *Statute*; but it's a meer falacy, and cauſeth the *Statute* to fail of it's principal end, which is to preſerve *Timber*.

3. The beſt *Remedy* againſt thinneſſe of *Woods*, is to plaſh them and ſpread them abroad, and cover them partly in the ground, as every *Countrey-man* can direct; by this means the *Wood* will ſoon grow rough and thick. It's good *Husbandry* likewiſe to fill your *Woods* with *ſwift growers*, as *Aſhes*,

Aſhes, *Sallow*, *Willow*, *Aſpe*, which are alſo good for *Hop-poles*, *Hoops*. *Sycamore* is alſo a *ſwift grower*. In *Flaunders* they have a kind of *Poplar*, called by them *Abell-tree*, which ſpeedily groweth to be timber.

4. That ſome Law be made, that they which fell, ſhould alſo *plant* or *ſowe*. In *Biſcay* there is a Law, if that any cut down a *Timber-tree*, he muſt plant three for it, which law is put into execution with ſeverity, otherwiſe they would ſoon be undone; for the *Countrey* is very mountainous and barren, and dependeth wholly on *Iron Mines*, and on *Shipping*: their *Woods* are not *copſed* there, but onely *Pollards*, which they lop when occaſion ſerveth. I know one, who was bound by his *Land-Lord* to plant ſo many Trees yearly, which according he did, but alwayes in ſuch places that they might not grow. In *France*, near to the Borders of *Spain*, they ſowe *Aſhkey*, which when they grow to ſuch a greatneſſe, that they may be ſlit into four quarters, and big enough to make *Pikes*, then they cut them down; and I have ſeen divers Acres together thus *planted*: hence come the *excellent Pikes*, called *Spaniſh-Pikes*. Some Gentlemen have ſown *Acorns*, and it's a good way to increaſe *Woods*. Though the time is long, I doubt not but every one knoweth, that it's excellent to plant *Willows* along the waters ſide; and *Aſhes* nigh their houſes for firing: for they are good pieces of *Husbandry*; and it's pity that it's not more put in practiſe. There is a Gentleman in *Eſſex*, who hath planted ſo many *Willows*, that he may lop 2000 every year: if others were as Ingenious, we ſhould not want fire-wood; *Oſiers* planted in low Moriſh grounds, do advance land from 5 s. *per* Acre, to 40 s. 50 s. 3 l. and upward; it's much uſed Weſtward of *London*: theſe *Oſiers* are of great uſe to *Basket-makers*. There is a ſort of ſmall *Oſier* or *Willow* at Saint *Omars* in *Flaunders*, which groweth on *Iſlands* which float up and downe; it's far leſſe than that which the *Weſtern* men call, *Eights*, with this they make their curious fine *Baskets*: this plant is worth the procuring, being ſo nigh: *John Tredeſcat* hath ſome plants of it. There

is

is a Plant likewiſe in *England* called the *ſweet Willows*; it's not onely good for ſhade and firing; but as I am informed, the leaves do not ſoure the graſſe, but that the Cattel will eat them ſooner then *Hay*: if this be ſo, it may be of ſingular uſe for *Meadows*.

5. That thoſe things which mightily deſtroy *Woods*, may be reſtrained, as *Iron-works* are; therefore the *State* hath very well done to pull down divers *Iron-works* in the *Forreſt* of *Dean*, that the Timber might be preſerved for *Shipping*, which is accounted the toughеſt in *England*: and when it is dry as hard as *Iron*, the Common-people did uſe to ſay, that in Queen *Elizabeth's* dayes the Spaniard ſent an *Ambaſſadour* purpoſely to get this *Wood* deſtroyed: how true this is I know not; but without queſtion it's admirable *Wood* for Shipping, and generally our *Engliſh Oake* is the beſt in the World for Shipping; becauſe it's of a great Graine, and therefore ſtrong: but the *Oaks* of other *Countreys* have a finer grain, and more fit for *Wainſcot*; and in this kind our Forefathers have been very provident; for we have an Act of long ſtanding, prohibiting *Iron-works* within twenty miles of *London*, and within three miles of the *River* of *Thames*: thou you may find *Iron-ſtone* in divers places, as in the great gravel-pit at *Woolwhich*. There are ſome Ingenious men, who lately have got a *Patent* for making *Iron* with *Sea-coal*: I hope they will accompliſh their deſires, for it would wonderfully advance this *Iſland*, and ſave *Wood*. There are two faults in Sea-coal, in reſpect of melting *Iron-oare*.

1. That it is apt to bake together, or cake.

2. It hath a *ſulphureous* fume in it, which is an enemy to *Metal*, and conſumeth it as we ſee by our *Iron-Bars* in *Windows* at *London*; ſo that the *Metallaine* Nature of the *Iron-ſtone* is much waſted by it, and that which remaineth is very brittle, and will be *Could-ſhire*. I know that by the mixture of *Coal* beaten with *loam*, and throughly dryed, one (if not both of theſe *Inconveniences*) may be taken away. In the *Dukes* of *Cleveland's* Countrey, they uſe halfe *Turffe*, half

Charcoal. There is a way by making a kind of *Barter* with *Loam*, *Urine*, &c. which will cauſe Charcoal to laſt very long, as I am informed: but theſe diſcourſes belong to another place.

13. *Deficiency of Bees.* It's a great *Deficiency* here in *England* without queſtion, that we have no more *Bees*, conſidering that they are neither chargeable, requiring only a few ſtraws for an houſe, nor troubleſome: and this *Iſland* may maintain ten times as many: for though a place may be overſtocked with theſe *Animals*, as with the greater; yet I know no part of this Land, that is ſo: and, I know divers places which would maintaine many hundred *Hives*, yet ſcarce one to be ſeen.

2. Our *Honey* is the beſt in the World, and *Wax* a ſtable Commodity. Further we know, that cold *Countreys*, not comparable to ours, as *Muſcovia*, have far greater quantity then we have; ſo that it's incredible what quantity is found in the *Woods*, if the ſtory of the man be true, who fell up even to the ears in *Honey*, and had there periſhed, had not a *Bear*, on which he caught hold, pulled him out. Now I have enquired, how it cometh to paſſe that there is ſo great ſtore of *Honey* in *Muſcovia*, conſidering the Winters are extream cold, and alſo very long: and I am credibly informed that firſt, the Spring when it beginneth, cometh extraordinary faſt, that the dayes are very long, and the Summers far dryer then ours here in *England*, ſo that the *Bees* are not hindered by continual *ſhowers*; as they are ſome years here in this *Iſle*: And laſtly, that the Countrey aboundeth much with *Firs*, and *Pine-trees*: which the Inhabitants uſually cut, that the *Gum*, *Roſinous*, or *Turpentine* ſubſtance may ſweat forth, to which places the *Bees* do come, and preſently fill themſelves, and return laden: and perhaps for theſe very reaſons, *Bees* thrive very much in *New-England*.

2. We are *Deficient* in the ordering of them. Not to ſpeak of the negligence of particular men, which is very frequent: nor to write a general ſtory of the ordering of them, becauſe it requireth much paper: and Mr. *Leveret*, and *Butler*;

ler; eſpecially the latter, hath written ſo exactly, and upon his own experience that little can be added to it: onely in a point or two I differ from him; of the which I will ſpeak briefly.

1. That we muſt take and deſtroy all the *Bees* for their *Honey*, and not drive them, as they do in *Italy* once or twice yearly.

2. That if a *Swarme* be poor with little *Honey*, that that *Swarme* ought to be taken, becauſe it is poor; ſo that the rich ſtocks are deſtroyed, becauſe they be rich, and the poor Swarmes, becauſe they be poor: ſo that be they rich or be they poor, they muſt be deſtroyed. An *Italian* reporteth, that in the City of *Aſkaly*, there was a Law made, that none ſhould deſtroy a *Swarme* of *Bees*, unleſſe he had a juſt cauſe; accounting it a part of extream injuſtice and cruelty, to take away without cauſe, both the goods and lives of ſuch good and faithfull ſervants. I am credibly informed, that an *Engliſh* Gentleman beyond the Seas, getteth many an hundred pound yearly, by keeping *Bees* after a new and Ingenious Manner, which is thus. He hath a room made very warm and cloſe; yet with Glaſſe-windows, which he can open at his pleaſure, to let the *Bees* fly abroad when he pleaſeth, where he keepeth his *Bees*, and feedeth them all Winter; with a *ſweet Compoſition* made of *Malloſſoes*, *Flowers*, *ſweet Wine*, *Milk*, *Raiſins*, &c. (for with ſuch things as theſe, they uſually feed *Bees* in *Italy*) and often times in Summer, when the weather is rainy, windy, or ſo diſpoſed, that the *Bees* cannot conveniently go abroad, he feedeth them at home with divers ſweet things, and gathereth divers flowers, and layeth them amongſt them, and ſticketh up many freſh boughs in divers places of his Rooms, that in *ſwarming-time*, they may ſettle on them; by theſe means he preſerveth all his Swarms, and gathereth an incredible quantity of *Honey* and *Wax*; and truly this way ſeemeth to be very profitable: for,

1. We know the *Bees*, (even as we ſay of the *Aunts*) will work continually, even night and day, Winter and Summer,

if that they were not hindered by darkneſſe, cold, and moiſture.

2. That *Bees* do not only make *Honey*, (for I ſuppoſe, that they have a peculiar propriety of making *Honey*, as the *Silk-worms Silk*) out of *Mildews* or *Honey*, but alſo out of all ſweet things, as *Sugar*, *Moloſſo s*, &c.

3. That many ſweet things may be had far cheaper then *Honey*; which (I ſuppoſe) the *Bees* will tranſmute into perfect *Honey*. This way, I conceive, would be very advantageous to us in *England*, for the preſerving of *late ſwarms*, and alſo for the enriching of *old ſtocks*, ſo that we need not deſtroy them, but might drive them from *hive* to *hive*, and ſet them to work again; and truly I think there is no place in the World ſo convenient for this purpoſe as *England*; becauſe that though our Winters be long, yet they are not very cold; but *Bees* would be ſtirring in them: and further our Summers are ſo ſubject to winds and rains, that many times there is ſcarce a fine day in a whole Week: and further *Moloſſoes*, *Refuſe-Sugar*, *Sweet-Woort*, *Milk*, &c. may be had at reaſonable rates.

I hope ere long to give an exact account of this experiment, and deſire thoſe who have any Ingenuities in this kind, freely to communicate them. I have not obſerved many things more of importance concerning *Bees* in my travels; onely in *Italy* they make their *Hives* of *thin boards*, ſquare in two ar three partitions, ſtanding either above one another, or very cloſe ſide to ſide, by the which means, they can the better borrow part of their *honey* when they pleaſe. In *Germany* their *hives* are made of ſtraw, to the which they have a ſummer-door, as they call it, which is nigh the top of the *Hive*, that the *Bees* when they are laden, may the more eaſily enter and diſcharge themſelves of their burthens.

3. We are to blame, that we do not imploy our *Honeys* in making *Metheglin*: It's true that in *Herefordſhire* and *Wales*, there is ſome quantity of this liquor made; but for want of good cookery it's of little worth; but uſually of a browne co-

colour, of an unpleasant taste: and as I suppose commonly made of the *refuse honey*, *wax*, *dead Bees*, and such stuffe, as they ordinarily make it else-where: for the goodhouse-wife thinks any thing good enough for this purpose; and that it is pity to spoyl good *Honey* by making *Mead*: but I know that if one take *pure neat Honey*, and ingeniously clarifie and scum and boyl it, a liquour may be made not inferiour to the best *Sack*, *Muskadine*, &c. in colour like to *Rock-water*, without ill odour or savour; so that some curious Pallats have called it *Vin-Greco*, *rich and racy Canary*, not knowing what name to give it for it's excellency. This would bring very great *Profit*, not onely to the *Publique*, by saving many a thousand pound disburſed for *Wines* through all the world; but would be very advantageous to private families, who use to entertain their friends very nobly, *Wines* being at present intolerably dear and naught; I hope therefore ere long to see it put in execution. An excellent drink not much unlike this may be made of *Sugar*, *Molosses*, *Raisins*, &c. of the which I have already spoken, yet think it fit to put you in mind of it again.

It's a great *Deficiency* here in *England*, that we do not keep *Silk-Wormes* (which in *Italy* are called *Cavalieri*) for to make *Silke*. I know that is a great *Paradox* to many, but I hope by this short discourse to make this truth to appear plainly: The first original of *Silk-worms* by what I read in Histories is from *Persia*, where in infinite numbers they are still *maintained*; and the *greatest profits* of that great *Monarch* do arise from hence: *China* also aboundeth very much with *Silke*. In *Virginia* also the *Silk-worms* are found wilde amongst the *Mulberry-woods*, and perhaps might be managed with great profit in those Plantations, if hands were not so scarce and dear. I suppose this *Silk-worme* of *Virginia* is produced by the corruption of the *Mulberry-tree*, as *Cochineal* from *Ficus Indica*, or *Indian-figtree*: for some ingenious & curious men who have strictly observed the generation of *Insects*, do find that every Plant hath an *Insect* which groweth

14. *Deficiency, concerning Silk-Worms.*

out of its corruption. (as divers sorts of lice from *Animals*) and that these *Insects* do usually feed on that Plant, out of which they were made, as *Lice* on the same *Animals* from whence they were engendred. I know a Gentleman here in *London*, who hath three or four hundred *Insects*, and can give a very good account of their original feedings. And also Mr. *Mercinet* in *Paris*, hath a large Book of the same subject. But to return to our purpose: I say that we had *Silkworms* first from *Persia*. In *Justinian's* time about 1000 or 1100 years ago, some Monks presented a few to him at *Constantinople*; where in his time they began to plant *Mulberies*: from thence it came to *Italy*, about three or four hundred years since: for the *Auncient Writers* of *Husbandry*, as *Cato*, *Pallad*, *Col mell*, do not so much as mention these creatures: and at length these have passed over the Mountains into *France* within an hundred years; where they flourish so much, that if we will believe our own *Authors*, they bring greater profit then the *Wine* and *Corn* of that large *Countrey*. But be it so or no, I know that *France* hath Silk enough to maintain their excesse of apparel, and to export *Plushes*, *Velvets*, &c. Now then if that these worms can thrive, not onely in the parched *Persia*, but also in *Greece*, *Italy*, yea in *France*; which differeth not much from the temper of *England*; why should we think, that they are confined to that place, and must move no further Northward? for they have come many an hundred miles towards the *North*, why not one hundred or two more? And further we see that *Mulberries*, which is their food, thrive here as well as in any place. But some will object, that our Air is too cold and moist. To which I answer.

Master Marshal.

1. That those who write of *Silkworms*, say, that you must take heed, that you make not the place too hot: for too much heat may destroy; and therefore that you must set the windows open to let in the cold Aire.

2. We know, that Moistnesse of Aire rather increaseth *Insects*, and nourisheth them. Indeed if Moisture hurteth, it's because that it too much corrupteth their food, and causeth

cauſeth a flux amongſt them: but this is eaſily prevented, as I ſhall ſhew you anon. But to be ſhort, it is not onely my opinion that *Silkworms* will thrive here, but the ſolid judgement of King *James*, and his Council, confirmeth the ſame: as you may ſee by his letter to the *Deputy-Lievtenants* of every County; wherein alſo many weighty reaſons are contained to convince men of the ſame, which Letter followeth anon, with the Inſtructions for the increaſe and planting of *Mulberry-Trees*. Printed by *Eliaz. Edgar*, in the year 1609.

Laſtly, We find by experience, that *Silk-worms* will thrive here, and therefore the matter is out of queſtion: for divers *Ladies*, *Gentlewomen*, *Scholars*, *Citizens*, &c. have nurſed up divers worms to perfection, though they have had little skill in the managing of them; and likewiſe not ſuch accommodations as are neceſſary for them; and more would they have done, if they could have had *Mulberry-leaves*. I am informed that one near *Charing-Croſſe* maketh a good living by them: as alſo another by *Ratliff-Croſſe*; yea, even in *Cheſhire* at *Duckenfield* they thrive & proſper. And therfore if we can bring up 100, why not 1000, yea, 100000, if we had food for them? Truly, I know no reaſon to the contrary, neither could I ever find one that could ſpeak any thing to the purpoſe againſt the buſineſſe. And further I muſt tell you, that the ordering of this *Worme* is very eaſie, none need to be bound Prentiſe to the trade; the ſpecial buſineſſe is to be carefull in feeding them, and keeping them ſweet; which things children uſe to do. He that would learn this Art exactly, let him read *Boneil*, but becauſe that the Book is in *French*, I will give you a few Rules.

Firſt, Endeavour to get ſtore of *Mulberry-trees*, which are of two ſorts, the *white* and the *black*. The *white* groweth greateſt, and hath a fine leafe, and ſweeteſt, and therefore fitteſt for the young worms. This is eaſily propagated by *Slips*, as *Quinces*, *Codlings*. The *Black-Mulberry* is difficultly propagated by *Slips*; but muſt be raiſed from *Seeds*, ſown either at *Michaelmas*, when the *Mulberries* are eaten: or kept in dry ſand till the Spring; and then ſowe or howe them in, as

other

other ſeeds and ſtones, and muſt be diligently weeded. This groweth not to be ſo great a Tree as the former: the leaves are rougher and harther, and fitteſt for the greater worms. When they are ſtrong and ready to ſpin, when your Trees are grown to a good bigneſſe, you may plant them forth, as is uſually done for *Walnut* in *Orchards*, or in waſte places, as they do in *Italy*, (for the *Fruit* is little worth, only the *Leaves* are uſefull,) where I have ſeen the Trees as bare of leaves at Midſummer as at Mid-winter. There are two ſorts of *Silk-worms*, the *Spaniſh* and *Calabrian*. The *Spaniſh* is the ſmaller and more tender, and maketh a finer ſilk. The *Calabrian* is greater and more hardy, and maketh more Silk, but coarſer. This ſort ſeemeth to be the beſt for this *Countrey*. When the *Mulberry-trees* begin to bud, take the *egs* of your Silk-wormes, and lay them on a piece of *ſtuffe* or *Say*, (ſome uſe to *Bathe* them firſt in warme *Malmſy*, and ſay that it maketh them ſtronger,) and carry them about you in the day in a *Box*, in the night lay them under your *Bed*, or in a warme *Oven*, till the wormes begin to come forth, then lay a piece of paper of the wideneſſe of the Box, cut full of holes on them, and on the paper lay *Mulberry-leaves*, and as faſt as they hatch they will crawle forth, and ſtick to the *Mulberry-leaves*; which remove into other *Boxes*, till all be hatched: then when they paſt their ſecond ſickneſſe, feed them on *ſhelves* two foot broad, and eighteen inches one from another: the Roome where you keepe your Wormes, muſt neither be a low place, nor nigh the tiles; but a middle Roome, warme and dry, yet ſometimes a little cold Aire is good.

Take heed of *Rats* and *Mice*, as alſo of *Hens*, *Robinredbreſts*, *Sparrows*, and other birds; for they will eat them.

They have four *Sickneſſes*, the firſt twelve dayes after they are hatched; and from that time at the end of every eight days: their ſickneſſe laſteth two or three dayes, and then they are to be fed but very little.

The whole time that the wormes do feed, is about nine weeks:

weeks: feed them twice daily at leaſt: at the firſt when they are ſmall, give them a few leaves; and as they grow greater, more, and feed them oftner. Let your leaves be dry and well aired upon a Table or Cloth before you give them; and gather not your leaves, till the dew be off; and in dry ſeaſons, if you can poſſibly, you may keep your leaves gathered three or four dayes, or longer.

Keep your *ſhelves* and *boxes* very clean: but take heed you touch not your wormes with your hands, when you remove them; but move them not when they are ſick.

In cold moiſt weather, ſet a *Pan* of *Coals* in the Room, and burn a little *Benjamin*, *Juniper*, &c. eſpecially when they are young, *(viz.)* the firſt five weeks; but afterwards, unleſſe it be extraordinary cold, give them Air, and keep them not too hot, and let the Room be well ſented with *Herbs*.

Let not your *Wormes* be too thick on the ſhelves: if any dye or be ſick, ſpeedily remove them, leſt they infect the reſt.

As ſoon as by the clear Ambour-colour of your *Wormes*, you perceive that they would ſpin; make *Arches* betwixt your ſhelves, with *heath* made clean, branches of *Roſemary*, *Lavender*, &c. where the *Worms* will faſten themſelves, and make their *bottoms* in two or three dayes, and about twelve or fourteen days after will come forth; before which time, you muſt take away the *bottome* which you will uſe for *Silk*, and kill the worm within, by laying the *bottoms* in the ſun two or three days, or in an hot *Oven*.

The *Bottom* which you will keep for ſeed, lay in a warme place, till the *Worms* come forth; which put on ſome pieces of old *Say*, *Grogran*, *Velvet*, made faſt to ſome wall: there they will engender, and the Male having ſpent himſelf falleth down and dyeth; ſo the Female, when ſhe hath laid her egs, which egs when they are *gray*, you may gently take them off with a knife, and keep them in a piece of *Say* in a dry place, till hatching time come.

The winding of the *Silk* off the *bottome* requireth a peculiar wheel, which an *Artificer* muſt make: one pound and

two ounces of the bottom yieldeth from one ounce to three of *Silk*.

An ounce of Spaniſh ſeed yieldeth ordinarily ſix, eight, or ten pound of *Silk*, and the *Worms* will eat 250. *li.* of *leaves*: the *Calabrian-Worms* being greater, do eat nigh 300. weight, and yeild eleven or twelve pound of *Silk*.

To conclude, I deſire all men ſeriouſly to conſider, what advantage this buſineſs will bring to this *Iſland*, if it be brought to perfection. Truly I know nothing doth hinder the want of *Mulberry-trees*, which will in little ſpace come to a conſiderable greatneſſe. And though I commend thoſe who endeavour to advance this work in *Plantations*, and prefer it before Tobacco; yet I know that it cannot be for want of hands; whereas in *England* we have plenty of women, children, old folks, lame, decrepit, *&c.* who are fit to be overſeers of this work. And I wonder Gentlemen do not go about a thing ſo pleaſant and profitable, (for three, four, or five at moſt, will attend as many *wormes* as will make forty or fifty pound worth of *Silk* in two or three months) and the *Worms* eat only leaves, which are of no value: neither is there any conſiderable trouble about the *worms*, unleſſe it be the 12 or 15 laſt days. I hope if that particular men will not endeavour to advance this work for their private profit, yet the *States* will for the *Publique Good*, it being the beſt way I know to ſet all the poor Children, Widows, old and lame people on work, and likewiſe will ſave this Nation many an hundred thouſand pounds *per annum*. And further, the way to accompliſh this work may be done without grievance to the Subject, (*viz.*) to command every one to plant or ſow ſo many *Mulberry-ſeeds*, which may eaſily be procured from beyond Seas, *&c.* But I leave States-matters to States-men, I am none.

A Copy

A Copy of King James's *Letter to the Lords Lieuteteuants of the ſeveral Shires of* England, *for the increaſing of Mulberry-Trees, and the breeding of Silk-Worms, for the making of Silk in* England.

JAMES REX.

Right-Truſty and Wel-beloved, We greet you well.

IT is a principal part of that Chriſtian care, which appertaineth to Soveraignty, to endeavour by all means poſſible, as well to beget, as to increaſe among their people the knowledge and practiſe of all Arts and Trades, whereby they may be both weaned from idleneſſe, and the enormities thereof, which are infinite, and exerciſed in ſuch induſtries and labours as are accompanied with evident hopes, not onely of preſerving people from the ſhame and grief of penury; but alſo raiſing and increaſing them in wealth and abundance, the Scope which every free-born ſpirit aimeth at, not in regard of himſelf onely, and the eaſe which a plentiful eſtate bringeth to every one in his particular, but alſo in regard of the honour of their Native Countrey, whoſe commendations is no way more ſet forth then in the peoples Activeneſſe and Induſtry. The conſideration whereof, having of late occupied our mind, who alwayes eſteem our peoples good, our neceſſary contemplations: We have conceived as well by the diſcourſe of our own reaſon, as by information gathered from others, that

the making of *Silk*, might as well be effected here, as it is in the *Kingdom* of *France*, where the ſame hath of late years been put in practiſe. For neither is the climate of this *Iſle* ſo far diſtinct or different in condition from that *Countrey*; eſpecially from the hither parts thereto, but that it is to be hoped, that thoſe things which by induſtry proſper there, may by like induſtry uſed here, have like ſucceſſe, and many private perſons who for their pleaſure have bred of thoſe worms, have found no experience to the contrary, but that they may be nouriſhed and maintained here, if proviſion were made for planting of *Mulberry-trees*, whoſe leaves are the *food* of the *worms*. And therefore we have thought good thereby to let you underſtand, that although in ſuffering this invention to take place, we do ſhew our ſelves ſomewhat an adverſary to our profit, which is the matter of our *cuſtoms* for *ſilk* brought from beyond the Seas, will receive ſome dimunition: Nevertheleſſe, when there is queſtion of ſo great and *publick utility*, to come to our *Kingdom* and *Subjects* in general; and whereby (beſides multitudes of people of both Sexes and all Ages) ſuch as in regard of impotency are unfit for other labour, may be ſet on work, comforted, and relieved; we are content that our private benefit ſhall give way to the publick; and therefore being perſwaded that no well-affected Subject will refuſe to put his helping hand to ſuch a work as can have no other private end in us, but the deſire of the welfare of our people, we have thought good in this Form onely to require you (as a Perſon of greateſt Authority in that County, and from whom the generality

rality may receive notice of our pleaſure with more conveniency then otherwiſe) to take occaſion either at the Quarter-Seſſions, or at ſome other publick place of meeting, to perſwade and require ſuch as are of ability, (without deſcending to trouble the poor, for whom we ſeek to provide) to buy and diſtribute in that County, the number of ten thouſand *Mulberry-plants*, which ſhall be delivered unto them at our City of, *&c.* at the rate of three farthings the plant; or at 6 s. the hundred, containing five ſcore plants. And becauſe the buying of the ſaid plants at this rate may at the firſt ſeem chargeable to our ſaid Subjects, (whom we would be loth to burthen) we have taken order that in *March* or *April* next, there ſhall be delivered at the ſaid place a good quantity of Mulberry-ſeeds, there to be ſold to ſuch as will buy them; by means whereof the ſaid plants will be delivered at a ſmaller rate then they can be afforded being carried from hence: having reſolved alſo in the mean time, that there ſhall be publiſhed in print a plain Inſtruction and Direction, both for the increaſing of the ſaid *Mulberry-trees*, the breeding of the *Silk-worms*, and all other things needfull to be underſtood, for the perfecting of a work every way ſo commendable and profitable, as well to the planter, as to thoſe that ſhall uſe the trade. Having now made known unto you the Motives as they ſtand with the publick good wherein every man is intereſted; becauſe we know how much the example of our own Deputy Lieutenants and Juſtices will further this cauſe; if you and other your neighbours will be content to take ſome good quantities hereof, to di-

ſtribute upon your own lands, we are content to acknowledge thus much more in this direction of ours; that all things of this nature tending to Plantation, increaſe of ſcience, and works of induſtry, are things ſo naturally pleaſing to our own diſpoſition, as we ſhall take it for an argument of extraordinary affection towards our perſon; beſides, the judgement we ſhall make of the good diſpoſitions in all thoſe that ſhall expreſſe in any kind their ready minds to further the ſame; and ſhall eſteem that in furthering the ſame, they ſeek to further our honour and contentment (having ſeen in few years paſt, that our Brother the *French* King, hath ſince his coming to the Crown, both begun and brought to perfection the making of *Silks* in his Countrey, where he hath won to himſelf honour, and to his Subjects a marvellous increaſe of wealth) would account it no little happineſſe to us, if the ſame work which we begun among our people, with no leſſe zeal to their good, (then any Prince can have to the good of theirs) might in our time produce the fruits which there it hath done: whereof we nothing doubt, if ours will be found as tractable and apt to further their own good, now the way is ſhewed them by us their Soveraign, as thoſe of *France* have been to conform themſelves to the direction of their King. Given under our Signet at our Pallace of *Weſtminſter*, the ſixteenth of *November*, in the ſixth year of *England*, *France*, and *Ireland*, and of *Scotland* the two and fortieth.

Inſtructions

Inſtructions for the increaſe and planting of Mulberry-trees.

What ground is fit for the Mulberry-ſeeds, *how the ſame is to be ordered, and in what ſort the ſeeds are to be ſowed therein.*

THe ground which ought to be appointed for this purpoſe, beſides the natural goodneſſe of it, muſt be reaſonably well dunged, and withal ſo ſcituated, as that the heat of the Sun may cheriſh it, and the nipping blaſts of either the North winde or the Eaſt, may not annoy it: the choice thereof thus made; that the ſeeds may the better proſper, and come up after they be ſown, you ſhall dig it two foot deep, breaking the clods as ſmall as may be, and afterward you ſhall divide the ſame into ſeveral Beds of not above five foot in breadth, ſo that you ſhall not need to endanger the plants by treading upon them, when either you water or weed them.

The Mulberry-ſeeds you ſhall lay in water for the ſpace of 22 hours, and after that you ſhall dry them again half dry, or ſomewhat more, that when you ſow them they may not cleave together: Thus done, you muſt caſt them upon the foreſaid Beds, not altogether ſo thick as you uſe to do other Garden-ſeeds, and then cover them with ſome fine earth (paſt through a Sive) about half an inch thick. In dry weather you ſhall water them every two days at the furtheſt, as likewiſe the plants that ſhall come of them: and keep them as clean from weeds as poſſibly you can.

The time in which you ought to ſow them for your beſt advantage, is either in *March*, *April*, or *May*, when froſts are either altogether paſt, or at the leaſt not ſo ſharp, or of ſo long continuance, as to endanger their up-ſpring.

There is yet another way to ſow them, and that is as followeth: you ſhall (being directed by a ſtraight line) make certain

tain furrows in the Beds above mentioned of ſome four fingers deep, and about a foot in diſtance the one from the other: After this, you ſhall open the earth with your hands, on either ſide of the aforeſaid furrows, ſome two fingers from the bottom, and where you have ſo opened it, ſhall you ſowe your ſeeds; and then cover them half a finger thick with the earth which you opened.

When the Plants that are ſprung up of the Seeds, are to be removed, and how they are to be planted the firſt time.

IN the months of *September*, *October*, *November*, *December*, *March*, or *April*, the next year after the Seeds are ſown, you may remove their plants, (or in the month of *January*, if it be not in froſty weather) and ſet them in the like Beds as before, and about one foot the one from the other, but firſt you muſt cut off their roots, about eight inches in length, and their tops about half a foot above the roots, more or leſſe, according to the ſtrength of the ſaid plants; for the weaker they be the leſs tops you ſhall leave them. In this ſort you may ſuffer them to remain (weeding & watering them as need ſhal require) till they be grown 6 foot in length above their roots, whereunto when once they have attained, you may cut their tops, and ſuffer them to ſpread, alwayes having a care to take away the many branches or ſuccours, that may any way hinder their growth, until they be come to their full length of 6 foot, as aforeſaid.

When, and how the Plants are to be removed the ſecond time, and in what manner they are to be planted where they ſhall remain.

IN the months aforeſaid, (according as your plants are waxen ſtrong,) you may remove them either into the hedges of your fields, or into any other grounds. If in hedges, you muſt ſet them ſixteen foot the one from the other, if in other ground, intending to make a Wood of them eighteen foot at the the leaſt. But a month before you do remove them, you muſt make the holes (wherein you purpoſe to ſet them) about four

four foot in breadth, and ſo deep as that their roots may be well covered, and ſome halfe a foot of looſe earth left under them, having alwayes a ſpecial care ſo to place them, that they may receive the benefit of the Sun, and not to be ſhadowed or overſpread by any neighbouring trees.

When, and how the Eggs of the Silk-worms are to be hatched, and how to order the Worms that ſhall come of them.

WHen the leaves of Mulberry-trees begin a little to bud forth, take the Eggs of your Silk-worms, and lay them in a piece of Say, or ſuch like ſtuff, and in the day time carry them in ſome warm place about you, in a little ſafe box, but in the night either lay them in your bed, or between two warm pillows, until ſuch time as the Worms begin to come forth: then take a piece of paper of the wideneſſe of the ſaid box, and having cut it full of ſmall holes, lay it within the ſame upon the eggs, and upon that again ſome few Mulberry-leaves, to which the Worms as they are hatched, will continually come. Theſe leaves with the Worms upon them, you muſt ſtill remove into other boxes, laying freſh leaves as well on thoſe that are removed as on the paper where the eggs are; and this is the courſe which muſt be duly kept and obſerved, until ſuch times as all the Worms be come forth of their ſhels, ſtill keeping their boxes warm, as aforeſaid; but no longer about you, but until the Worms begin to come forth, out of which boxes you may ſafely take them, when once they have paſt their ſecond ſickneſſe, and feed them upon ſhelves of two two foot in breadth, and eighteen inches one above the other.

The ſaid ſhelves are not to be placed in any ground-room, nor yet next unto the tiles, but in ſome middle room of your houſe which openeth upon the North and South, that you may the more conveniently give them either heat or aire, according as the time and ſeaſon ſhall require. Beſides, you muſt not make them cloſe unto the Wals, but ſo as you may paſſe

about them the better to look unto the Worms, and keep them from Rats and Mice, which otherwise might devour them. You muſt obſerve the times of their coming forth, and keep every one or two dayes hatching by themſelves, that you may the better underſtand their ſeveral ſickneſſes or ſleepings, which are four in the time of their feeding. The firſt commonly ſome twelve days after they are hatched, and from that time at the end of every eight days, according to the weather, and their good or ill uſage, during which time of every ſickneſſe, which laſteth two or three dayes, you muſt feed them but very little, as onely to relieve ſuch of them, as ſhall have paſt their ſickneſs before the reſt, and thoſe that ſhall not fall into their ſickneſſe ſo ſoon.

The whole time that the Worms do feed, is about nine weeks, whereof until they come unto their firſt ſickneſſe, give them young Mulberry-leaves twice every day, but few at a time; from thence until their ſecond ſickneſſe, twice every day in greater quantity; and ſo from their ſecond to their third ſickneſſe, increaſing the quantity of the leaves, according as you perceive the Worms to grow in ſtrength, and clear of ſickneſſe: from the third until their fourth ſickneſſe, you may give them leaves thrice every day, and the fourth being paſt, you may let them have ſo many as they will eat, always having a care that you give them none but ſuch as are dry, and well aired upon a Table or Cloth, before they be laid upon them, and withal gathered ſo near as may be; at ſuch times as either the Sun or Wind hath cleared them of the dew that falleth upon them.

For the feeding of Worms you need obſerve no other order then this, lay the Mulberry-leaves upon them, and every two or three dayes remove them, and make clean their boxes, or ſhelves, unleſſe in times of their ſickneſſe, for then they are not to be touched: the leaves which you take from them when you give them freſh to feed upon, you muſt lay in ſome convenient place, and upon them a few new leaves, to which the Worms that lay hidden in the cold, will come, and then you may paſſe them with the ſaid new leaves to the reſt of the Worms:

Worms: And now left any thing ſhould be omitted, which ſerves to perfect the diſcovery of ſo excellent a benefit, I will adviſe you to be very diligent in keeping clean their Boxes, or ſhelves, as being a ſpecial means whereby to preſerve them; wherefore when you intend to do it, you ſhall remove them together with the uppermoſt leaves whereon they lie, unto other boxes or ſhelves, for with your hands you may not touch them, till they have throughly undergone their third ſickneſs, and then may you paſſe them gently with clean hands, without doing them any harm: provided that the party that cometh near them ſmell not of Garlick, Onions, or the like. The firſt five weeks of their age you muſt be very carefull to keep them warm, and in time of rain or cold weather, to ſet in the room where they remain, a pan with coals burning in it, now and then ſome *Juniper*, *Benjamin*, and ſuch like, that yeildeth ſweet ſmells. But afterwards unleſſe in time of extraordinary cold, give them air, and take heed of keeping them too hot, being alwayes mindfull to ſtore the room with herbs and flowers which are delightful and pleaſing to the ſmell. As the worms increaſe in bigneſſe, you ſhall diſperſe them abroad upon more boards or ſhelves, and not ſuffer them to lie too thick together, and if you find any of them brown, or of a yellow gliſtering colour inclining to ſickneſſe, caſt them away, leſt they infect the reſt, and ſort ſuch as are not ſick, the greateſt and ſtrongeſt by themſelves, for ſo the leſſer will proſper the better.

When and how to make fit rooms for the worms to work their Bottoms of ſilk in, and in what ſort the ſaid bottoms are to be uſed.

AS ſoon as by the clear amber-coloured bodies of your worms, you ſhall perceive them ready to give their ſilk, you muſt (with *Heath* made very clean, or with the branches of Roſemary, the ſtalks of Lavender, or ſuch like) make Arches between the foreſaid ſhelves.

Upon the branches and ſprigs whereof, the worms will faſten themſelves, and make their bottoms, which in fourteen

dayes after the worm beginneth to work them, you may take away; and thoſe which you are minded to uſe for the beſt ſilk, you muſt either preſently wind, or kill the worms which are within them, by laying the ſaid bottoms two or three days in the Sun, or in ſome Oven after the bread baked therein is taken out, and the fierceneſſe of the heat is alaid. The other bottoms which you intend to keep for ſeed, you muſt lay in ſome convenient warm place, untill the Worms come forth, which is commonly ſome ſixteen or twenty dayes from the beginning of their work: and as they do come forth you muſt put them together upon ſome piece of old *Say*, *Grogeran*, the backſide of old *Velvet*, or the like, made faſt againſt ſome wall, or hangings in your houſe.

There they will ingender, and the Male having ſpent himſelf, falleth down, and in ſhort time after dieth, as alſo doth the Female when ſhe hath laid her eggs, which eggs, when you perceive them upon the *Say*, or *Grogeran*, &c. to be of a grayiſh colour, you may take them off gently with a knife, and having put them in a piece of *Say*, or ſuch like, keep them in a covered box amongſt your woollen cloaths, or the like, till the year following: But not in any moiſt room, for it is hurtful for them, neither where there is too much heat, leſt the worms ſhould be hatched before you can have any food for them.

The making of a Wheel, as likewiſe the way to winde the ſaid ſilk from the bottoms, can hardly be ſet down ſo plainly, as to be rightly underſtood: Wherefore when time ſhall ſerve, there ſhall be ſent into every County of this Kingdom, a wheel ready made, and a man that ſhall inſtruct all ſuch as are deſirous to learn the uſe thereof: Till when, I ſhall commend theſe brief inſtructions to be carefully conſidered of all ſuch as are willing either to benefit themſelves, or their Countrey, that being skilful in the Contemplation, they may the readier, and with leſſe errour apply themſelves to Action, which painful induſtry, with Gods aſſiſtance, will quickly perfect.

15. *Deficiency, concerning the Huſbandry of other places.*

15. *Deficiency is the ignorance of the Huſbandry of other places, (viz.)* what ſeeds, what fruits, what graſſes they uſe, what

what Ploughs, Harrows, Gardening-tools they have; how ſtill they mannage and improve their lands; what cattel they have, how they feed and fatten them, and how they improve their commodities, *&c.*

For there is no Countrey where they are ſuch ill Husbandmen, but in ſome particular or other they excel: as we ſee even in the ſeveral Counties of this Iſland, every County hath ſomething or other wherein they out-ſtrip their Neighbours. And that much profit may ariſe from hence in this Nation, is manifeſted by that excellent Treatiſe, which is publiſhed by you concerning the Husbandry of *Flanders*; wherein are briefly ſet down divers particulars very uſeful for us here in *England*, and formerly unknown. And without queſtion, *France*, *Spain*, *Italy*, *Holland*, *Poland*, *Germany*, &c. have many excellent things both for Husbandry, Phyſick, Mechanicks, worth the manifeſting and very beneficial to us: ſo likewiſe there are divers things in our Plantations worth the taking notice of in Husbandry. To paſſe by the Southern Plantations, as *Barbadoes*, *Antego*, Saint *Croix*, *Chriſtopher*, *Mevis*, *Monſorate*, where the commodities are onely Cotten-wools, Sugars, Gingers, Indicoes, which our cold climate will not produce; and alſo Tobacco which groweth alſo with us, about *Norwich*, and elſewhere: We will onely fall upon our Northern Plantations, *Virginia*, *New-England*, and inſtance in a few things. Why may not the Silk-graſs of *Virginia*, the *Salſaparilla*, *Saſſarfas*, *Rattle-ſnake-weed* (which is an excellent cordial) be beneficial to us, as alſo their Cedars, Pines, Plumtrees, Cherries, great Strawberries, and their *Locuſts*, (which is a prickly plant, a ſwift grower, and therefore excellent for hedges) be uſeful to us? So for *New-England*, why ſhould we think that the *Indian corn*, the *March* Wheat, that excellent *Rie*, the *Peaſe* (which never are eaten with magots,) the *French*, or *Kidney-Beans*, the *Pumpions*, *Squaſhnes*, *Water-mellons*, *Muſk-mellons*, *Hurtleberries*, *wild Hemp*, *Fir*, &c. of thoſe parts are altogether uſeleſs for us? as alſo the *Crãberries*, (which are ſo called by the *Indians*, but by the *Engliſh*, *Bearberries*, becauſe it is thought the *Bears* eat them in Winter; or *Barberries*, by reaſon of their fine acid taſt like *Barberries*,)

ries,)which is a fruit as big & as red as a Cherry,ripe only in the Winter, and growing close to the ground in bogs, where nothing else will grow? They are accounted very good against the Scurvy, and very pleasant in Tarts. I know not a more excellent and healthfuller fruit.

But some will object, that they will not grow here with us, our fore-fathers never used them. To these I reply, and ask them how they know? have they tryed? Idleness never wants an excuse; and why might not our fore-fathers upon the same ground, have held their hands in their pockets, and have said, that Wheat and Barley would not have grown amongst us? and why should not they have been discouraged from planting Cherries, Hops, Liquorice, Potatoes, Apricocks, Peaches, Melicotones, and from sowing Rape-seeds, Colliflowers, Great Clover, Canary-seeds, *&c.* and many more of this kind? and yet we know, that most of these have been brought to perfection, even in our days: for there is a vicissitude in all things,and as many things are lost which were known to our fore-fathers, as the Purple colour,*&c.* as you may read in *Pancirol*: so many things are found out by us, altogether unknown to them. and some things will be left for our posterities. For example, not to speak of Gun-powder and Printing, nor of the New-world and the wonders there, which notwithstanding are but of a few hundred years standing: I say twenty Ingenuities have been found even in our days, as Watches, Clocks, Way-wisers, Chains for Fleas, divers Mathematical Instruments, Short-writing, Microscopes, by the which even the smallest things may be discerned, as the eggs, eyes, legs, and hair of a Mite in a Cheese: Likewise the Seleno-scope, which discovereth mountains in the Moon, divers Stars, and new Planets, never seen till our days. But to return to our purpose, I say that in Husbandry it is even so; for the Ancients used divers plants which we know not; as the *Cytisus-tree*, so much commended for Cattel; as also their *Medick-fodder*, which *Colum* saith endureth ten years, and may be mowen the four first years, seven times in a year, and one Acre he esteemeth enough for three horses. This fodder likewise is accounted very

sweet

ſweet and healthful, whereas the plants which are uſually call-ed *Medicaes* with us, are annual plants, and have no ſuch rare proprieties. So we are ignorant what their *Far* or fine Bread Corn was, what their *Lupine*, *Spury*, and an hundred of this kind, as you may read in *Mathiol.* on *Diſcorides*: ſo on the contrary, infinite are the Plants which we have, and they knew not, as well appeareth by their ſmall and our large Herbals: and daily new Plants are diſcovered, uſeful for Husbandry, Mechanicks and Phyſick; and therefore let no man be diſcoura-ged from proſecuting new and laudable ingenuities. And I de-ſire Ingenious Gentlemen and Merchants, who travel be-yond Sea, to take notice of the Husbandry of thoſe parts (*viz.*) what grains they ſow? at what times and ſeaſons? on what lands? how they plough their lands? how they dung and im-prove them? what Cattel they uſe? and the commodities thereby? alſo what books are written of Husbandry, and ſuch like? and I intreat them earneſtly, not to think theſe things too low for them, and out of their callings; nay, I deſire them to count nothing trivial in this kind, which may be profitable to their Countrey, and advance knowledge. And truely, I ſhould thank any Merchant that could inform me in ſome tri-vial and ordinary things done beyond Sea, (*viz.*) how they make *Caviare* out of Sturgeons Rows? in *Muſcovia*, how they boyl and pickle their Sturgeon, (which we *Engliſh* in *New-England* cannot as yet do handſomly?) how the *Bolo-gna* Suſages are made? how they ferment their Bread with-out Yeſt? of what materials divers ſorts of Baskets, Brooms, Frails are made? what ſeed Grout or Grutze is made of? and alſo how to make the *Parmiſane* Cheeſes of *Italy*, which are uſually ſold here for 2 s. or 2 s. 6 d. *per* pound; or the *An-gelots* of *France*, which are accounted better Cheeſes then any made in *England*; as alſo the *Holland* Cheeſes, which are far better then our ordinary Cheeſes, and yet theſe ſorts of Chee-ſes are made not of Mares milk, as ſome think, but from the Cows, and our Paſtures are not inferiour to theirs, *&c.*

2. I deſire ingenious men to ſend home whatſoever they have rare of all ſorts; as firſt, Animals, the fine-woolled ſheep

of

of *Spain*; *Barbary* Horſes, *Spaniſh Jennets*, &c. and ſo likewiſe all ſorts of Vegetables, not growing with us, as *Pannick*, *Millet*, *Rice*, which groweth in the Fenny places of *Millan*, and *France*; and why may it not grow in our Fens, and the beſt ſorts of Grains or Fruits in uſe amongſt them? perhaps there is Wheat that is not ſubject to Smut or Mildew; perhaps other ſeeds will give double increaſe, as Flax, Oats, Peaſe; and divers other things of importance there are beyond Sea, which may be uſeful to us; as the Askeys, the Cork, Acorns, the Scarlet-Oak, ſweet-Anniſe, which groweth abundantly in *Millan*, *Fennel*, &c. Tilia or Linder-tree for baſt Ropes, &c. Spruce Pines for Maſts and Boards, ſeeing that they are ſwift growers, and many will ſtand in a ſmall piece of ground: they have formerly grown here, and ſome few do flouriſh in our Gardens, and in *Scotland*. I ſuppoſe that this ought ſeriouſly to be conſidered: for although we have plenty of Oaks, yet what will it profit for Shipping without Maſts? and how difficult it is to get great Maſts above 22 inches *diameter*, is very well known. Many things I might add of this kind, but for brevities ſake I refer you to Maſter *John Tredeſcan*, who hath taken great pains herein, and daily raiſeth new and curious things.

3. Conſider that theſe new Ingenuities may be profitable, not onely to the Publick, but alſo to Private men: as we ſee by thoſe who firſt planted Cherries, Hops, Liquorice, Saffron, and firſt ſowed Rape-ſeeds, Colliflowers, Woad, Would, Early Peaſe, Aſſparagus, Melons, Tulips, Gilliflowers, &c. and why may we not find ſome things beneficial to us alſo?

16. *Deficiency, of the ignorance of things taken from the earth and Waters of this Iſland.*

16. *Deficiency is the ignorance of thoſe things which are taken from the Earth and Waters of this Iſland.*

Although it may ſeem to many that theſe things do little concern the Husbandman, who uſually is not a Naturaliſt, but onely endeavoureth to know his own grounds and the ſeeds proper for it, and ſeldome pierceth into the bowels of the earth: yet if we conſider that out of the earth he hath Marle, Lime, Stone, Chalk, for the enriching his lands; and alſo Loam and Sand for his buildings: often times fuel for fire, &c. it will

will plainly appear, that it is neceſſary for him to know all ſubterrany things, and to be a Petty-Phyloſopher, and that the knowledge of theſe things will be very beneficial for him. And here I cannot but take notice of a great deficiency amongſt us, (*viz.*) that we have not the natural hiſtory of all the Sands, Earth, Stones, Mines, Minerals, *&c.* which are found in this Iſland: it would not only advance Husbandry, but alſo many other Mechanick Arts, and bring great profit to the publick. I hope ſome ingenious man will at length undertake this task; for the Lord hath bleſſed this Iſland with as great variety as any place that is known, as ſhall in part appear anon; and it may be proved by that great variety which is found near the *Spaw-Waters* in *Knaresborough*, as Doctor *Dean* relateth in his Book called the *Engliſh Spaw: Or the glory of* Knaresborough *ſpringing from ſeveral famous Fountains there adjacent, (called the Vitriol, ſulphurous and dropping Wells) and alſo other Mineral waters, whoſe words are theſe: Here is found not onely* white and yellow Marle, Plaiſter, Oker, Rudd, Rubrick, Freeſtone, *an hard* Greet-ſtone, *a ſoft* Reddiſh-ſtone, Iron-ſtone, Brimſtone, Vitriol, Niter, Allum, Lead, *and* Copper: *(and without doubt divers mixtures of theſe) but alſo many other* Minerals *might (perhaps) be found out by the diligent ſearch and induſtry of thoſe who would take paine to labour a little herein.*

Printed at *York* by *Thomas Broad*, being to be ſold in his ſhop at the lower end of Stone-gate, near to Common-Hall Gates, 1649.

This Letter will not permit me to make a compleat *Natural Hiſtory* of the things of this Iſle; yet I ſhall relate divers things which may be as hints to ſet ſome others to work, which I have found in *Mr. Cambden* and others: and ſhall briefly inſtruct the Husbandman what he ought to take notice of, for his own and others good. And firſt, if he live nigh the Sea, let him take notice of thoſe things the Sea caſteth up; for it hath even with us, and alſo in *Ireland*, caſt up Amber-greece, which is worth ſo much Gold; with the which not long ſince a Fiſherman of

Plymouth greaſed his boots, not knowing what it was: ſometimes it caſteth up Jet and Amber, as at *Whitbey* often times. In former times we had Oyſters which had very fair great Pearls in them of good worth; and at this time ſome of them are found in *Denbighſhire*; *Coperas-ſtone* likewiſe is found along by the Sea-Coaſts of *Kent*, *Eſſex*, *Suſſex*, *Hampſhire*, out of the which *Corporas* is made, a thing very uſeful for *Dyers*, *Curriers* &c. Further *Sea-weeds* are not to be ſlighted; for in *Jerſey* they have no other fuel amongſt them; and here in *England* it is burnt to make *Kelp* for *Glaſſemen*, and is alſo very good manure for divers Lands; alſo *Sea-owſe* is not onely good to lay on Land, but at *Dover*, and other places, the Inhabitants make *Brick* thereof, called *Flanders-Bricks*, &c. Sea-ſands in *Cornwall* do very much enrich their Lands; and in *Lancaſhire* out of a certain kind of Sand they extract Salt, *&c.*

2. Let him take notice of all ſorts of *Waters*, which iſſue forth of the earth, differing from the ordinary, in Colour, Odour, Taſte: for it is well known how advantagious theſe waters are, often-times, not only to particular men, but alſo to the Countrey about; yea to the whole Iſland, as appeareth by the waters of *Tunbridge* in *Kent*, and of *Epſham* in *Surrey*, *Knaresborough*, &c. *Spaw* in *York-ſhire*, and by the *Allum-Waters* in *Newenham* in *Warwick-ſhire*, like Milk in taſte and colour, and are excellent for the Stone and wounds; and alſo it appeareth by the ſalt Fountains in *Worceſterſhire* and *Cheſhire*, which furniſh all thoſe parts with an excellent fine white ſalt: by the hot *Bathes* in *Summerſetſhire*, and the luke-warm waters by *Briſtol*, &c. At *Pitchford* in *Shropſhire* is a Fountain which caſteth forth liquid *Bitumen*, which the people uſe for Pitch, *&c.*

3. Let him not deſpiſe the ſorts of Sands which he findeth: for ſome Sands are for buildings, as the rough ſorts; others for ſcowring others for caſting fine metals, as *Highgate-ſand*; others for the *Glaſſe-men*, as a ſand lately found in *Suſſex*. In *Scotland* there is a ſand, which containeth a conſiderable quantity of Gold: and in divers Countreys fine Gold aboundeth

boundeth very much in ſands; and if we may believe an excellent *Dutch Chymiſt*, there is ſcarce any ſand without it.

4. Let him take notice of the Earth, Loams, Clayes, *&c.* which have divers and neceſſary uſes: as firſt, the ſtiffeſt Clays, as *Newcaſtle* and *Nonſuch*, are for the *Glaſſemens* Pots, for *Crucibles*, melting-pots: the leſſe ſtiffe for ordinary Earthen wares, *Brewers*, *Tiles*, *Bricks*, &c. white Clay is for *Tobacco-pipes*: *Marle* of divers colours and ſtiffneſs is excellent for *Huſband-men*: *Fullers-Earth* is found in *Kent*, *Surrey*, and lately in divers other places, for the great benefit of the *Clothier*: Rub and Rubrick in *York-ſhire*, as alſo divers other in *Oxford* and *Gloceſterſhire*, excellent for *Painters*, &c. *Turffe* for firing may be found in moſt parts of this Iſle, if people were induſtrious: neceſſity now and then compelleth them to be inquiſitive, as it did lately at *Oxford* and *Kent*, where it is found in good quantity. In *Holland* they have little fuel, ſave what is taken out of their ditches; and therefore it is truely ſaid, that their firing is as it were fiſh'd out of the water, and it's indifferent good fuel: *Coals* are found in very many places, yet divers places are in great want of them.

5. Let him take notice of the ſeveral ſtones found in this Iſle; as of Freeſtones for building. Cobbels and rough hard ſtones for paving, Tomb-ſtones; ſoft ſandy ſtones commonly called fire-ſtones, becauſe they will endure ſtrong fires, and therefore fit for Iron furnaces; and this propriety theſe ſoft ſtones have, that when they are white hot, a ſteele inſtrument will ſcarce touch them to hurt them. Alabaſter is found at *Burton* on the *Trent*, and in *Stafford ire* and at *Titbury* Caſtle: excellent Marble at *Snotkil* in *Herefordſhire*: a courſe Marble near *Oxford*; in *Kent*, alſo at *Purbrick* in *Dorſetſhire*, Milſtones in *Angleſey*, in *Flintſhire*, *Darbyſhire*, Lime-ſtones: Chalk in very many places for divers uſes: Allum-ſtone is found in *Angleſey*, but eſpecially at *Giſborrow* in *York-ſhire*, where the Allum works are, which ſerve this Iſland: *Lapis Calaminaris* is lately found in *Somerſetſhire*, by the which Copper is made braſſe: *Manganeſe* for thoſe that make white glaſſe, lately found in the *North*: the beſt Emery for poliſhing Iron in *Jerſey*:

ſey: Plaiſter at *Knareſborough*: Black-lead in *Cumberland*: and no where elſe in *Europe*: There is a ſtone in *Durham* out of which they make ſalt; Diamonds are found about *Briſtol* and *Cornwall* very large, but ſoft: There is a ſtone near *Beaver* Caſtle like a Star. In *York-ſhire* another like a Serpent petrefied: and alſo other ſtones round like bullets, which being broken have as it were a Serpent in them without an head, *&c.*

6. Of all Minerals and Metals, *Iron-ſtone* is found almoſt in every County, and is profitable where Wood is plentiful: the beſt is found in *Lancaſhire*, one load and an half making a Tun of Iron: it hath been tranſported into *Ireland*, to mix with poor *Mine*. In *Richard* the ſeconds time a *Copper-Mine* was found in *Wenlock* in *Shropſhire*, but exhauſted: in Queen *Elizabeth's* dayes one was found at *Keſwick* in *Cumberland*: and ately in *Staffordſhire*, *York-ſhire*, and near *Barſtable* in *Devonſhire*: on which ſome Gentlemen intend ſpeedily to work: *Lead* is found in *Durham*, *Wales*, and *Devonſhire*; *Brimſtone* in *York-ſhire* and *Wales*, *Antimony* in *Staffordſhire*: a ſilver Mine in *Cardiganſhire*: a gold Mine was diſcovered in *Scotland* in King *James* his time: and many rich Mines might be diſcovered in *England*, if that the Kings Prerogative (which was to take all Royal Mines to himſelf, *(viz.)* Silver, Gold, & Copper,) were ſo cerainly aboliſhed, that they which ſhould find theſe Metals in their own Lands, might ſafely dig them. But ſome wil object & ſay, that many things are of little worth and profit. To theſe I anſwer, that God hath made nothing in vain, every thing hath his peculiar uſe, and though ſome things ſeem to be of little worth and contemptible, as Sand, Loam, Chalk; yet it hath pleaſed the wiſe Creatour to make theſe things very neceſſary for mans comfortable ſubſiſtence, which they that want theſe things can teſtifie. As for example, in *New-England*, where there is no Chalk nor Lime-ſtone, they are compelled to burn *Oyſter-ſhels*, *Cockles*, to make *Lime*; or elſe they could hardly build any houſes. The like I may ſay of Sand and Loam in divers places, where they are wanting.

2. I ſay that moſt of thoſe things I have ſpoken of, are very profitable in one place or other. To inſtance in ſome of the meaner

meaner ſort, at *London* Brick-men give 50 *li. per* Acre, onely for Loam to make Bricks, and pay 3 *li. per* Acre, of yearly Rent, and are to leave the Land worth the ſame yearly Rent; likewiſe I know a Chalk-cliff in *Kent* not two Acres of ground, valued at many an hundred pound, and that one Colum of Chalk which is ten foot ſquare, is valued at forty or fifty pound at 8 d. *per* load. The Oker Mines of *Oxford* and *Glocesterſhire* are of great value, and ſo would others of that kind, if they could be found; ſo is the Black-lead Mine. Alſo the pits of Clay, Marle, Coale, Turffe, *&c.* And therefore I deſire all Country men to endeavour to know all ſorts of Stones, Clays, Earths, Oares, and to teach their Children the uſe of them, that they may know that this ſand is for building, this Loam is for Bricks, this Clay for Pots, this Marle for Corn-land: and if that they ſhall find any Stones, Earths, which they know not, that they would lay them up, till that they meet with ſome ingenious man, that can inform them. The richeſt Mines of the world have been found out by theſe means, if we will believe Hiſtories. And this I am ſure of, that by this means they may much advance their knowledge, and be more profitable to the Publique, their Neighbours, and alſo to themſelves.

17. *Deficiency, is the ignorance of the Vegetables of this Iſland, and their Vertues and Uſes.*

17. *Deficiency, of the Vegetables of this Iſland and their Vertues & Uſes.*

And the firſt Deficiency that I take notice of, is the ignorance of the ordinary ſeeds which are commonly ſown amongſt us: for uſually the Countrey-man contenteth himſelf with one or two ſorts, and knoweth no more, when as there are very great varieties; ſome of which agree with one ſort of ground, ſome with another: As for example, there are very many ſorts of Wheats, ſome called White Wheat, ſome Red Wheat, ſome Bearded; (which, as I have ſaid before, is not ſo ſubject to *Mildews* as others) others not: ſome ſorts with two rows, others with four, and ſix: ſome with one ear on a ſtalk, others with double ears, or two on the ſame ſtalk; Red-ſtalk Wheat of *Buckinghamſhire*, Winter Wheat, Summer Wheat, which is ſown abundantly in *New-England*, in *April* and *May*,

and reaped ordinarily in three months; and many ſorts more. Not to trouble my diſcourſe with *Spelt*, *Zea*, *Tiphine-Wheat*, or *Olew*, *Far*, *Siligo*, *Alica*, which were uſed amongſt the Ancients; but now unknown not onely to the Countrey-man, but even to the learnedeſt *Botanicks*: ſo I may ſay that the ordinary Yeoman is ignorant of the diverſities of *Barley's*, for there is not onely the ordinary *Barley*, but big ſprat-Barley, which hath lately been ſown in *Kent* with good profit; alſo Winter-Barley ſowen in Winter, Barley with four, ſix rows, naked Barley, which require divers diſpoſitions in Land: ſome delighting in finer, others in ſtiffer grounds. So there is alſo Peas. Winter and Summer-Rie, and twenty ſorts of Peaſe, the ordinary Schew, the Raith or Early-ripe Peaſe, the Roncivals, Haſtivers, Hotarſes, Gray-Peaſe, Green-Peaſe, Peaſe without skins, Sugar-Peaſe, whoſe ſhels are ſweeter then the Peaſe it ſelf, and have been within theſe ten years plentifully ſowen in *Lincolnſhire* with profit; alſo *Fulham*, *Sandwich*-Peaſe, &c. which require divers ſorts of lands and ſeaſons: ſo alſo there are divers ſorts of Oats, white, black, naked, which in *New-England* ſerveth well for Oatmel without grinding, being beaten as they come out of the Barn; *Scotch*, *Poland*, &c. Alſo Buck-wheat, Lentiles; divers ſorts of Tares, of Hemp and Flax, altogether unknown to moſt Countrey-men, but I hope that hereafter they will be more inquiſitive after them: for divers of them may be of good uſe on their lands.

2. *Deficiency* in this kind is, that they are ignorant of the Plants and Graſſes which naturally grow amongſt us, and their Uſes, which likewiſe were made for to be food for Cattel, and alſo for the ſervice of man. This ignorance cauſeth them to admire, and to eſteem even as miraculous, ordinary and trivial things; as for example, how it cometh to paſſe, that in one Meadow an Horſe thriveth very much and ſpeedily, and yet a Bullock will not in that place; and contrariwiſe in a Meadow cloſe by the former, the Bullock will thrive, and the Horſe not: ſo alſo how it cometh to paſs that Conies and Sheep will thrive well, where there is ſcarcely any paſture, and yet come to nothing on Commons, where there is a greater quantity of paſture;

ſture; which proceedeth from this cauſe, that ſome kind of Plants are more agreeing and ſweeter to one ſort of Cattel then to another, and every Beaſt almoſt hath ſome Plant or other which they love exceedingly. I ſuppoſe, that the obſervances of this kind, might be very uſeful in Husbandry. Theſe *Deficiencies* I will draw to three Heads.

1. I ſay, that divers Plants (not to ſpeak of Fruits, becauſe we have already ſpoken of them) that grow naturally in our Iſland, may be very ſerviceable to the Husbandman, both for his Paſtures and Corn-lands. To inſtance in ſome few: we ſee that divers ſorts of wild Vetches, Chiches, Tares, *&c.* grow wild in divers places which though they bear not ſo great and large crops, as ſome others already uſed; yet who knoweth what they would do, if they were manured as other grains, and in land proper for them: for we ſee that the tranſplanting of plants into gardens, doth very much meliorate or better them; and without doubt all thoſe grains, which are in uſe with us, were at firſt picked out of the fields and woods; and by ingenious men found uſeful for man and beaſt, and of late divers have been found not known to our fore-fathers, as Saint *Foin*, *Lucern*; and why may not we find divers Graſſes, Vetches, Medicaes, Wild Peaſe, *&c.* which as yet are ſcarce taken notice of.

2. There grow divers ſorts of wild Peaſe, but to ſpeak of two only.

1. Sort which groweth on the ſtony Beaches of the Sea, where there is little or no earth, the roots are many foot deep in the ground. In Queen *Maries* dayes in a dearth, the poor people gathered divers ſacks full of them, and they were no ſmall relief to them, who hath tried whether they would thrive better on better land?

2. Sort groweth on dry barren land, and is commonly called the everlaſting Peaſe; which continually groweth out of the ſame root. In Gardens I have ſeen it grow ten years together, and larger at the ten years end, then at the firſt. I have alſo ſeen it flouriſh on barren grounds, where Oats were burned away: who knoweth but theſe and other Plants may be ſerviceable,

ſerviceable, if not for man, at leaſt for beaſts or pigeons: for in *New-England* the great flights of Pigeons are much maintained by theſe, I am ſure it were good to make experiments of theſe and divers others.

2. Head, is the *Ignorance of the Mechanical uſes of Herbs and Trees*; for even for theſe uſes moſt Plants have ſome peculiar propriety. To inſtance in a few, We know that Elm is for Wheels; and the beſt wood to make Herrings red, Oak is for Shipwright, Joyner, Tanner; Horn-Beams, Beech, for Milwright; Line-tree for Baſs-ropes; old Elder without pitch is very tough and fit for Cogs of Wheels, Tooth-Pickers; Pear-tree for Mathematical inſtruments and ingravers, *&c.* Oſiers for baskets; Walnut for Gunſtocks; Aſp for Hoops, Box, Aſh for an hundred uſes; and much more might be ſpoken of this kind, if time would permit. So likewiſe divers Plants are for Painters, as you may ſee in *Battees* experiments: ſome for the Dyers, but as yet we know but four, (*viz.* Woad, Would, Green-wood, and Madder) amongſt 1200 Plants and upward; which grow wild with us. I could wiſh ſome ingenious man would take the paines to ſearch out the Mechanical uſes of Plants; ſurely it were a good way to advance Mechanicks, who in their callings uſually go round; as horſes in a mill, and endeavour very little to advance or know the cauſes of their operations. I know a Gentleman, who promiſeth ſome things in this kind, and I hope will be as good as his word.

3. Head, is the ignorance of the Phyſical uſes of the Plants: for though many hundred Plants doe grow amongſt us: yet but few of them are uſed Phyſically: whereas there is ſcarce any one but may be uſeful in this kind. And truely in my opinion it is a great fault that we ſo much admire thoſe things, that are far fetched, and dear bought; when as often-times they are gathered in unſeaſonable times, and corrupted by long voyages by Sea, counterfeited by Merchants; yea we have very oft *quid pro quo*, and rank poyſons, and neglect thoſe medicines which God hath given us here at home. I am credibly informed that in former times, *Virga aurea* was in great uſe with us, and uſually ſold for eight pence *per ounce*, and brought

brought from *France*: but so soon as it was found growing plentifully in our hedges, it was cast forth of the Apothecaries shops, as of little vertue. And though some will object that our Plants have little vertue: I say it's false; for God hath tempered them for our complections: and we see very oft that one simple medicine doth more good then the great compositions of the Ancients, which are rather *ad pompam*, then for health, and seem to savour somewhat of the *Mountebank*, becaus *Opium* is alwayes an ingredient. And further we see that where any Endemical or National disease reigneth, there God hath also planted a specifique for it: As the *Cochleare*, or the *Scurvy-grass* for the *Scurvy*; in the *Baltick* Sea, where it is very frequent, and also in *Holland*, *England*. So in the *West-Indies*, (from whence the great *Pox* first came, and where it reigneth very much, that not onely man but other Creatures are infected with it, so that even *Dogs* die of that disease in our *Northern* Plantations, perhaps catching this infection, by mingling with *Indian Dogs*) there grow the specifiques for this Disease, as *Guajacum*, *Salsaperilla*, *Sassafras*, and the *Salvages*, do easily cure these distempers. Further we see, that even the irrational creatures can find not only meat, but also medicines for themselves; as the *Dog*, *Couch-grass* for a vomit: the *Dove*, *Vervein*; the *Weasel*, *Rue*; the *Swallow*, *Celandine*, the *Toad* *Plantine*; and where is our reason that we cannot?

I therefore desire all Country people, to endeavour to know these Plants which grow at their doors: (for God hath not planted them there for no purpose; for he doth nothing in vain) and to collect together the plain simple *Medicaments* of their *Grandame*; by this means they may save many a forty pence: I mean preserve themselves and Families, and Neighbours, in good health with little charge. Some small Treatises have of late been written, to shew the use of our Plants in *Physick*; and I hope ingenious men will daily more and more communicate the secrets of this kind, which they have in their hands for the Publique good.

They that write of four-footed beasts, do reckon about an hundred and twenty *species* of them: half of them are scarce-

17. *Deficiency, concerning Animals.*

ly known amongſt us. I do ſuppoſe therefore, that divers *ſpecies* are wanting, which may be uſeful. To inſtance in ſome: And

1. To begin with the *Elephant*, the greateſt, wiſeſt, and longeſt lived of all Beaſts: which abound very much in the Eaſtern parts of the world; as *China*, *India*, and are accounted very ſerviceable, both for the Warres, and for carriage, (fifteen men uſually riding on his back together) they are not chargeable to keep; why may they not be of uſe even here, when I am credibly informed, an *Elephant* lived divers years here in a Park? ſo that they can endure the coldneſſe of this Climate.

2. The *Buffle*, which is as big as an *Ox*, and ſerviceable both for the Plough, and for their Milk: their skins make the beſt *buffe*, they will fare very hard and live in *Fens* and *Bogs*, where nothing elſe can. In the Duke of *Florences* Countrey near *Piſa*, are many of them.

3. The honeſt and patient *Aſſe*, which was very much uſed in the old time for carriage, (as the Horſe for War, and the Ox for the Plough,) and in many Countreys at this time; they will eat Thiſtles, and live even with nothing. They may ſave poor men (who are not able to keep an Horſe, becauſe he is a great feeder,) much labour.

4. *Mules*, which is a very ſtrong and proud beaſt, and will carry far more then an Horſe, and are more ſure footed. I ſuppoſe, that they might be ſerviceable to the Carriers here, as they are beyond the Seas. In *Ireland* before the War, a Gentleman *G. R.* had divers, even in the *North*, and found them ſerviceable. Five *Camels*, which will carry great burthens: their hair is the ground of *Mo-hair*. Six *Dromedaries*, which go ſwiftly, &c. Seven Black *Foxes*, may be profitable; whoſe skins have been ſold from 20 l. *per* skin, to 90 l. I might adde divers more of this kind: as *Musk-Cats*, *Sables*, *Martines*, *Minkes*, *Musk-Squaſh*, *Guiney-Pigs*, and a ſort of *Cony*, which ſome few have in *Hampſhire*, whoſe *Fur* is worth 2 s. 6 d. or 3 s. *per* skin, being little inferiour to *Beaver*, &c. but for brevities ſake I paſſe them over: as alſo divers ſorts of Fowls, of

good

good uſe; as a kind of Duck with a crooked bill, which layeth conſtantly as Hens do, as alſo Hawks of divers ſorts of good value, which perhaps the Countrey-man loveth not; becauſe they are enemies to his Poultry.

2. *Deficiency* is, That we doe not endeavour to advance the beſt kinds of the Cattel, which are amongſt us. And

1. To begin with Horſes. The *French-man* that writeth a Book called, the *Treaſure-Polick*, ſaith, that in *England* in Queen *Elizabeth's* days, we had not above three or four thouſand Horſe worth any thing for the War, and thoſe onely in Noble-mens ſtables, which thing perhaps did the more encourage the *Spaniard* to invade us; but at this time we are known to have very many thouſand of Horſe not inferiour to the beſt in the world: yet I ſuppoſe, that we might much meliorate our breed by *Spaniſh Jennets*, *Barbary*, *&c.* And we are not ſo careful to encreaſe good horſes as we ſhould be.

2. We are too negligent in our Kine, that we advance not the beſt *ſpecies*: for ſome ſorts give abundance of milk, and better then others: ſome ſorts are larger, more hardy, and will ſooner fat, *&c.* *Lancaſhire*, and ſome few Northern Counties, are the onely places where they are a little careful in theſe particulars.

3. We are not curious in procuring the beſt ſorts of ſheep, for greatneſſe, ſoundneſſe, and fine wool. I wonder that ſome Sheep-maſters have not procured of thoſe exceeding fine-wooled ſheep of *Spain*; whoſe wool coſteth the Merchant nigh 10*s.* *per pound*, before it is exported: I ſuppoſe that it would for a time mend our wool, if not continue ſo for ever: for theſe ſheep were firſt carried forth out of *England*, if we may believe ſtories, *Spain* not affording ſuch ſheep before. *Dutch*-ſheep are reported to have two or three Lambs ordinarily. *Turky*-ſheep are very great, with great tails; but their wool is very courſe, not onely becauſe of their courſe feeding; but alſo becauſe in hot Countreys, they ordinarily mingle with Goats, and therefore in *Venice* ordinary Porters will ſcarce eat any Mutton. And here I cannot but relate, that all ſtrangers very much wonder at two things in our ſheep, (not to ſpeak of the fineneſs of wool.) And

1. That our ſheep if they be ſound, ſeldome or never drink, even in Summer; though they go on the drieſt Chalky lands: as it plainly appeareth in *Kent*, where there is ſcarce water for the great Cattel, which proceedeth from the moiſture of our air, and abundance of rain and dews.

2. That our ſheep do not follow their ſhepheards as they do in all other Countries: for the ſhepheard goeth before, and the ſheep follow like to a pack of dogs, this diſobedience of our ſheep doth not happen to us, as Papiſts Prieſts tell their ſimple flocks; becauſe we have left their great ſhepheard the Pope; but becauſe we let our ſheep range night and day in our fields without a ſhepheard; which other Countries dare not for fear of Wolves, and other ravenous beaſts, but are compelled to guard them all day with great dogs, and to bring them home at night. or to watch them in their folds.

3. *Deficiency* in this kind, is the neglect of Fiſh-ponds, which are very profitable: for Fiſh uſually live by ſuch worms and flies as are ingendred in the ponds, and require no charge. Concerning the ordering of them, and profit of them, read Maſter *Dubravius's* Book of Fiſh-ponds tranſlated out of Latin into Engliſh. And another ſhort Treatiſe called, Certain experiments concerning Fiſh, practiſed by *John Taverner* Gentleman, and by him publiſhed for the benefit of others. And ſurely it would be a great benefit to this Iſland if we had Fiſh at reaſonable rates. I cannot therefore paſſe by two extream abuſes, which exceedingly deſtroy Fiſh, and are in no wiſe to be permitted.

1. That divers poor men keep many Swine, and in nets, or otherwiſe catch many buſhels of the young fry of Fiſh, and feed their Swine with them.

2. That the Fiſher-men in the River have the Meaſhes of their nets ſo ſtraight, that they take many ſorts of Fiſh, when they are too ſmall, and ſo deſtroy the young fry. I hope theſe abuſes will be reformed with all ſeverity. To this Head I may adde *Decoys*, which are very frequent in *Holland*, and profitable, but very rare with us in *England*: yet it may be very profitable and delightful.

4. *Deficiency*, is the ignorance of the Inſects of this Iſland. And

And though it may ſeem ridiculous to many, to affirm that *Magots*, *Butterflies*, ſhould be of any importance; yet I deſire them to conſider, that we have our Honey, the ſweeteſt of foods from *Bees*, which are Cattel of this kind: alſo our *Silks*, *Sattins*, *Pluſhes*, and bravery from the poor *Silk-worm*, which may be called a *Magot*, *Caterpillar*, or *Butter-fly*, &c. the richeſt of our colours from the *Cochenelle*, which is one of this ſort *Gum-lac* is made by *Ants*, ſome are uſed for food, as *Locuſts*, &c. as you may read in *Muſſet's* Book *de Inſectis*. Many of theſe likewiſe are uſed in Phyſick, as *Cantharides*, *Wood-ſowes*, *Lice*, &c. Some think, that Medicines tranſcending even in the *Chymiſts*, may be had out of theſe; for every Plant, which hath a Medicinal vertue, is alſo ſublimed up into this living Quinteſſence: and therefore I commend divers ingenious men, as Mr. *Marſhal* and others, who have collected many hundred ſorts of theſe; and I hope they will communicate ere long their experiments to the world.

19. *Deficiency concerning divers things neceſſary for the good of Cattel.* 19. *Deficiency, concerning divers things neceſſary for the good of Cattel.*

1. That we are ignorant of divers Diſeaſes of Cattel and their Cures. Not to run over all the diſeaſes of Cattel and their Cures, which would be too long, and you may read them in Maſter *Markam's* works, the Countrey-Farmer, and others. I will inſtance only in two, which ſome years ſweep away Cattel, as the Plague doth men, (*viz.*) the Murrein amongſt great Cattel, and the Rot amongſt Sheep. And though divers have wrot concerning the Cures of theſe Diſeaſes; yet we doe not find that effect which we deſire: and therefore I hope ſome will attempt to ſupply this *Deficiency*, and write a good Treatiſe about the Diſeaſes of Cattel. Of theſe two Diſeaſes, I ſhall briefly declare my mind: And

1. Of the Murrein, which proceedeth from an inflamation of the blood, and cauſeth a ſwelling in the throat, which in little time ſuffocateth the Cattel. The eſpecial Cauſes of this Diſeaſe, are a hot and dry ſeaſon of the year; which dryeth up the waters, or at leaſt doth ſo putrify them, that they are unwholſome; and alſo the letting of Carrion lie unburied. This

Diſeaſe is thought to be infectious; but perhaps it may proceed from one common cauſe, as the rottenneſſe of ſheep. The beſt way to keep your Cattel from this Diſeaſe, is to let them ſtand in cool places in Summer, and to have abundance of good water, and ſpeedily to bury all Carrion: and if any of your Cattel be infected, ſpeedily to let them blood, and to give them a good Drench, *&c.* By theſe means divers have preſerved their Cattel, when their Neighbours have periſhed.

2. Concerning the Rot of Sheep, not to ſpeak of the Pelt-rot, or ſheep that are ſtarved; but of the ordinary rot, called by ſome the white rot, and is a kind of dropſie, their bellies are full of water, and their liver diſcoloured. I have ſeen out of the livers of ſheep tending to rottenneſſe, living Creatures, leaping like ſmall *Flounders*; which without queſtion in little time will deſtroy the liver, and conſequently produce an indiſpoſition not unlike to the Rot. The common people ſay, that theſe worms are cauſed by the over-heatings of ſheep, and that Rottenneſſe proceedeth from a Plant called *Cotyledon*, or *Marſh-Penny-wort*, which is of a very ſharp taſt, and therefore not likely that ſheep will eat it; but it may be a ſigne of wet rotten land, as broom is of ſound and dry land. This is certain that in wet moiſt years, ſheep dye very much of the Rot; and in dry years on the ſame ground, they hold ſound: and yet I have heard that in *Ireland*, which is far moiſture then *England*, rottenneſſe of ſheep is not known ſo much. It were therefore well worth the labour of an ingenious man to inquire into the cauſes of theſe indiſpoſitions in ſheep.

The means, which have been found very effectual for the curing of theſe Diſeaſes, are theſe: firſt, to drive your ſheep up to dry Lands, or to keep them in the fold, till the dew be off the graſs, or to feed them ſome days with fine dry hay, eſpecially of ſalt Meadow, or to put them into ſalt Marſhes: for in thoſe places ſheep never rot, or to drive them to ſome ſalt River, and there to waſh them, and make them drink of the water, this will kill the ſcab, and alſo the ticks, and faſten the wool: but if you have not the conveniences before ſaid, then rub their teeth with ſalt, or rather make a ſtrong pickle with

ſalt

ſalt and water, and force them to drink thereof. Some dry pitch in an Oven, and adde to the pickle, and have found very good ſucceſs: for theſe Medicines do exſiccate the ſuperfluous humidities, open obſtructions, and kill worms. Some commend the Antimonial Cup, as a Catholick Medicine againſt all diſeaſes of cattel.

2. We are ignorant of divers ingenuities, concerning feeding and fatting of cattel and other creatures. To inſtance in ſome; And

1. *Of the Horſe*, who is a great feeder. In *Kent* and *Hartfortſhire* they uſually cut all their *Oats* and *Peaſe* ſmall, and give them with their chaff; by this means the Horſes ſooner fill themſelves, and eat all the ſtraw up: ſome put the Horſe-meat into a bag, and ſo order it that a little only lyeth in the Manger; which when that is eaten up, more falleth down, and not before; by this way Horſes do not blow their meat, nor throw it out of the manger with their Noſes. A further good piece of Husbandry they uſe, which is this, when their Horſes are well fed at night, they fill the Rack with Wheat or Barley-ſtraw, and ſo leave them; the Horſe perceiving that that which is in the Rack is not very pleaſant, lyeth down and taketh his reſt, which is as good to him as his meat: if he riſe in the night, and fall to the rack and manger, as he uſually doth, and findeth nothing but ſtraw, he ſleepeth till the morning; but if it be Hay, Tares, or Peaſe, the Jade will pull it all down, and ſpoil it, and and likewiſe will be hindered from his reſt; by the which double damage doth inſue. *Currying* and dreſſing of horſes ought not to be forgot, it is half as good as their meat. *Brimſtone* and *Elecampane* roots are the eſpecial ingredients for this Phyſick. For *Worms* and *Surfet* are the two commoneſt Diſeaſes.

2. *Of the feeding and fatting of Cows.* We uſuall feed cattel with ſtraw in racks in the yard, or turn them to the fields, and there let them feed as much and how they pleaſe; which hath many inconveniences: as firſt, Cattel ſpoil as much with their heels as they eat, eſpecially if the ground be moiſt, or if the flie be very troubleſome, and they blow & ſtench, & tumble much, and if the flie be buſie, they run up and down, and over-heat themſelves,

ſelves, and fat very little, ſo that often-times in *June* or *July* they fatten as little as at *Chriſtmas*, and moſt of their dung is loſt by theſe means, *&c.* But in *Holland* they do thus: They keep their Cattel houſed Winter and Summer; for the Winter proviſion, they lay in not only hay, but alſo grains, (which they buy in Summer, and bury in the ground:) and alſo Rape-ſeed, and Lin-ſeed cakes, and ſow Turneps, not only for themſelves, but their Cows alſo; with the which Turneps being ſliced, and their tops, and Rape-ſeed cakes, and Grains, *&c.* they make Meſhes for their Cows, and give it them warm; which the Cows will ſlop up like Hogs, and by this means they give very much milk. In the Summer time they mow the great Clover-graſſe, and give it them in racks; ſo that their Cattel are not troubled with the pinching froſts, nor rains, nor with the parching Sun in Summer, neither with the Flie, nor do they over-heat themſelves or ſpoil half ſo much meat; and are always as fat as their Maſters, or Bacon-hogs. The Dung and Urine they charily preſerve, and thereby keep their Meadows of Clover-graſs, (which are conſtantly mowen twice or thrice yearly) in good heart: and indeed cattel ought not to go amongſt Clover-graſs, becauſe it uſually groweth with long *Haum* (as they call it) like Peaſe, which if it be broken will not thrive. In *Bermudas* they have a peculiar way of fattening their cattel, not uſed any where elſe that I know, which is with *Green-Fennel*, that groweth in that Iſland plentifully.

There is a Plant in *Eſſex* called *Myrchis* or *Cow-purſley*; which groweth faſt and early in the Spring, which they give their cattel at the beginning of the year, and they eat it well.

It is an ill cuſtom that is uſed almoſt every where, to let hogs lie in their dirt and dung, when they are fattening; for all creatures generally do hate and abhor their own dung: and an hog is cleanlieſt of all creatures, and will never dung nor ſtale in his ſtie, if he can get forth, which other creatures will: and though he tumble in the dirt in Summer; yet that is partly to cool himſelf, and partly to kill his lice, for when the dirt is dry, he rubbeth it off, and deſtroyeth the lice thereby.

Sir

Sir *Hugh Platts* in his writings ſetteth down divers ingenious ways of fattening Poultry, *&c.* and more may be found out daily. The *Jews* have a peculiar way of fattening Geeſe, with Milk, Figs, Raiſins, and other ſweet things, by which they make the liver of an extraordinary greatneſſe, and is a diſh much valued by them, as it was alſo among the old *Romans*.

In *Moor-fields*, there is one that keepeth many hundreds of Conies with grains and bran: and ſome others who keep the great laying Ducks, with theſe things and blood, to their great advantage. I have ſeen a Book tranſlated out of *French*, which teacheth how to gain divers hundred pounds *per annum*, by fifty pound ſtock in Hens. I ſuppoſe about *London* where Eggs are ſo dear, great profit might be made by them. Turkeys might be kept with good profit, where there are many Meadows as in *Suffolk*. In *Barkſhire* many keep tame Pheaſants, and have gained well thereby.

3. We do not know how to improve the Commodities proceeding from Cattel to the higheſt: as for example our ordinary butter might be better ſented and taſted: ſome Ladies have fine ingenuities in this kind. We cannot make Cheeſe comparable to the *Parmiſan*, nor ſo good as the *Angelots* of *France*, our ordinary Cheeſe is not comparable to the *Holland* Cheeſes, where alſo divers ſorts of Cheeſes are made of divers colours: but I cannot much commend their green Cheeſes, which are made of that colour by Sheeps-dung, *&c.* but I hope in ſhort time our good Houſ-wifes will ſcorn that any ſhall excel them.

20. *Deficiency, Of the want of divers things which are neceſſary for theaccompliſhments of Agriculture.*

20. *Deficiency, Is the want of divers things, which are neceſſary for the accompliſhment of Agriculture*—As

1. That we have not a *Syſtema*, or compleat Book of all the parts of Agriculture. Till the latter end of Queen *Elizabeths* days, I ſuppoſe that there was ſcarce a book wrote of this ſubject; I never ſaw or heard of any. About that time: *Tuſſer* made his verſes, and *Scot* wrote about an Hop-garden, *Gouge* tranſlated ſome things. Lately divers ſmall Treatiſes have been made by divers, as Sir *Hugh Platts*, *Gab*, *Platts*, *Markham*, *Blith*, and *Butler*, who do well in divers things; but their

books cannot be called compleat books, as you may perceive by divers particular things; not ſo much as mentioned by them. The Countrey-Farmer tranſlated out of *French* is enough, if not more then enough; but it is no ways framed, or ſquared for us here in *England*: and I fear the firſt Authors went on probabilities and hear-ſays, rather then experience. I hope ſome ingenious man will be encouraged to undertake a work ſo neceſſary and commendable.

2. *Deficiency*, is, That Gentlemen try ſo few experiments, for the advance of this honeſt and laborious calling; when as many experiments might be made for a ſmall matter; for half a Pole ſquare, will give as certain a demonſtration, as an Acre; and a Pottle, as an Hogſhead. I hope in time there will be erected a Colledge of Experiments, not only for this, but alſo other Mechanical Arts.

3. *Deficiency*, is, That Gentlemen and Farmers do not meet and communicate ſecrets in this kind, but keep what they have experimented themſelves, or known from others; as *Sybils* leaves: I mean as rare ſecrets, not to be communicated. I hope that we ſhal ſee a more cõmunicative ſpirit amongſt us ere long. And Sir, I cannot but deſire you, if you have any things more in your hands of *Gabriel Platts*, or any mens elſe, that you would with ſpeed publiſh them.

4. *Deficiency*, is, That we want a place to the which men may reſort for to find ſuch ingenious men, as may be ſerviceable for their ends and purpoſes; and alſo know where to find ſuch ſeeds and plants as they deſire, as the great *Clove-graſs*, *Saint Foin*, *La. Lucern*, &c.

5. *Deficiency*, is, That men do uſually covet great quantities of land, yet cannot manage a little well. There were amongſt the ancient *Romans* ſome appointed to ſee that men did till their lands as they ſhould do; and if they did not, to puniſh them as enemies to the Publique; perhaps ſuch a law might not be amiſs with us: for without queſtion the Publique ſuffereth much, by private mens negligences; I therefore wiſh men to take *Columel's* Counſel; which is, *Laudato ingentia Rura, Exiguum Colito.* For *Melior eſt culta exiguitas*, &c. as another

another ſaith, or as we ſay in *Engliſh*, *A little Farm well tilled is to be preferred*: for then we ſhould not ſee ſo much waſt land, but more induſtry, greater crops, and more people imployed, then are at this preſent, to the great profit of the Commonwealth. I know a Gentleman, who yearly letting more and more of that land he uſed to keep in his hands, yet confeſſeth his Barns are fuller, becauſe he more diligently manageth what remaineth. 6. I will adde that either through the negligence or ignorance of moſt men, the enemies of the laborious Husbandmen are not deſtroyed: *viz.* Crows, Rooks, which pluck up in light land preſently after the Corn ſpeareth, much Corn, and alſo devour much Corn when ripe: theſe are deſtroyed either by ſhooting, or by breaking their eggs in the Spring, or at leaſt may be ſcared with a little ſmoak, or with a few feathers. Larks alſo do much hurt, which may be taken in ſnares, or by day-nets, Low-belling, &c.

What Corn is in the barn, and alſo in the field, Mice and Rats oft-times deſtroy much, which are eaſily deſtroyed either by Weaſils, which are far better then Cats (though ſomewhat miſchievous to eggs and poultry) for two of them will ſpeedily clear a Ship, though troubled with many hundreds; and therefore I know divers Maſters of Ships very inquiſitive for them, proffering five ſhillings for one with many thanks, ſo that it would be very beneficial both to Ships, and alſo to thoſe, who would take the pains to breed them tame, as many do in *Ireland* for their pleaſure; Rats alſo may well be deſtroyed by Ratſ-bane, which is white Arſenick, or with Sublimate and Butter. But theſe things will hardly be procured from the Apothecaries, becauſe they are ſomewhat dangerous: therefore Gardiners do uſe very much *Nux vomica*, which may be had every where, with a little butter, but take heed of the Dogs. Moals likewiſe do much hurt both to Corn and Paſture, and are too much neglected, though they may eaſily be deſtroyed, either with a Moal-ſpade, or by finding their Neſts in *March*, which uſually are in ſome extraordinary hills, or elſe by putting a deep pot in the earth where they run a clicketting in the Spring, or by a Moal-trap which the Gardiners frequently uſe

about *London*, &c. Alſo it were good to deſtroy the Birds, called *Tom-tits*, which are great enemies to *Bees* and fruit, *Sparrows*, *Finches*, *Snayl*, *Warms*, &c.

7. I cannot but adde to this place the failings in divers particulars in reſpect of ſome particular places, *viz.* the planting of Saffron, which is very well performed in ſome parts of *Eſſex*, *Cambridge*, &c. yet altogether unknown in *Kent*, though there are Lands both white and red, (as they call them) with plenty of dung very proper for that purpoſe, and yet this commodity is excellent; and further I can adde as a Deficiency that I have never ſeen nor heard of any thing written on this Subject to any purpoſe.

2. The planting of Hops, (concerning which *Scot* in Queen *Elizabeths* days wrote an excellent Treatiſe, to the which little or nothing hath been added, though the beſt part of an hundred years are ſince paſt, and much experienced in this kind amongſt us,) for though many fine Gardens have been planted in the *Southern* parts, yet the *Northern* are deficient, ſo that often-times we are neceſſitated to have great quantities from *Flaunders*.

3. Liquorice is much planted about *Pomfret* in *York-ſhire*, and about *London*, but little that I hear of elſe-where, ſo that we are ſometimes beholding to *Spain* for it.

4. Would is ſown in divers parts of *Kent*, not much in other places, therefore we are oft beholding to the *Weſtern* Iſles for it.

21. *Deficiency, that becauſe of our ſins We have not the bleſſing of God upon our labours.*

5. Wade, which is abundantly ſown about *Coventry*, and yet in *Kent* thought to be a forraign Commodity, this is of excellent uſe, and deſerveth to be ſown every where. I might here alſo adde *Madder*, which is very neceſſary, and ſcarcely ſown any where; as alſo Canary-ſeeds, Carawayes, which are abundantly ſown about *Sandwich* and *Deal*, in *Kent*, alſo Rape, Cole-ſeeds, &c. whoſe oyl is of great uſe, alſo of Fruit-trees, Gardening, Hemp, Flax: but of theſe I have largely diſcourſed before.

21. *Deficiency, is, by reaſon of our ſins We have not the bleſſing of the Lord upon our labours.*

And

And this the reaſon, that although the Husbandman hath been laborious and diligent in his calling theſe laſt years; yet our Crops have been thin, his Cattel ſwept away, and ſcarcity and famine hath ſeized on all parts of this Land; and if we had not been ſupplyed from abroad, we had quite devoured all the creatures of this Iſland for our ſuſtenance, and yet we could not be ſatisfied, but muſt have devoured one another. And therefore to conclude, though I deſire the Husbandman to be diligent and laborious in his calling, yet I counſel him to *break off his ſins by Repentance*, to have his eye towards him who is the *Giver of every good thing*, and to pray daily to him for his bleſſings, who *giveth freely to them that ask, and upbraideth not*. And although all callings ought to look up to him that is *on high*, yet the Countrey-man eſpecially; for he hath a more immediate dependance on him then any other: for if the Lord with-hold his *fat dew from Heaven*, or the *former or latter Rain*, *it is in vain* that the Husbandman *riſe up early, and go to bed late, and eat the bread of carefulneſs*: for we know, that it is the Lord *that maketh barren places fruitful*, and he likewiſe *that turneth fruitful Lands into barrenneſs*, (as the Land of *Canaan*, which was very fruitful even in the time of the *Canaanites*, but now a barren deſart) and therefore, I again deſire the Countrey-man to walk as it becometh a *Chriſtian, in all Sobriety, Righteouſneſs and Godlineſs*: *not to truſt, or put his confidence in his own labours*, and good Husbandry; *but on the Lord that hath made all things*: for though even *Paul himſelf doth plant, and Apollo doth water*; *yet it is only the Lord that giveth increaſe* and plenty, *which he will not deny to thoſe that fear him*; *for they ſhall want nothing that is good*.

Laſtly, for a Corollary, I will adde, (though it doth not ſo much concern the Husbandman, as thoſe of greater Power and Authority) That it is a great Deficiency in *England*, that we do not magazine or ſtore up Corn, when the Lord ſendeth us plenty, and therefore at cheap rates (as *Joſeph* did in *Egypt* againſt dear years) for then the Grain is pureſt & the perfecteſt, without Smut, Mildew, Shrankneſs, or other imperfections, and is the beſt for long preſervation: this is much uſed in *Poland*, State Granary

land, Dantrigk, Italy, Holland, &c. and is found of wonderful importance. By this means *Holland* which ſoweth little or no Corn, ſeldome or never feeleth a famine, though it be incredibly populous: and for want of this good policy, *England* which many years aboundeth with Corn, is ſore bitten therewith, as is manifeſt in theſe laſt years, in which had not our Neighbours wiſely and politickly provided for us, we ſhould have famiſhed and devoured one another.

Further, This ſtoring of Corn will ſave vaſt Sums of money which in dear years are exported for bread: and alſo well ballance the price of Corn, ſo that the honeſt Husbandman needs not murmure and be diſcouraged, becauſe that the price is low, and Markets ſcant in plentiful years, (becauſe then the Magazins are to be reſtored) nor the *Artizans* be famiſhed by the exceſſive rate of bread in dear years, for then the Magazines are to be exhauſted. The beſt way for the wiſe carrying on of this buſineſſe, the Politicians muſt lay forth, but that belongs not to our calling. Yet I ſhall here as I have done in former things, give ſome general hints, and leave the reſt to thoſe who are wiſer.

And firſt, The City of *London*, (which is the mouth of the *Iſland*, and as I am credibly informed by Meal-men, ſpendeth about 5000 Quarters of Wheat weekly, and I ſuppoſe it cannot do leſſe, conſidering there cannot be leſſe then 600000 people therein, and about, *viz.* at leaſt an hundred thouſand in the 97 Pariſhes within the Walls, and four times as many without the Walls as appeareth by the Bills of Mortality, and at leaſt an hundred thouſand ſtrangers of all ſorts which proportion is leſſe then four l. of bread the week for one) this place ought (I ſay) to have a conſiderable Magazine for three or ſix months, ſomething hath been done in this kind by our fore-fathers, as appeareth by the particular ſtore-houſes of the private Companies, which ſtore-houſes ought to be augmented in number, as the Companies yearly are, and alſo the Quantity of Grain, becauſe the City daily grows more populous.

2. I would have the Inhabitants of other great Cities and Corpo-

Corporations, as *York*, *Briſtol*, *Norwich*, *&c.* to be numbred, and a like proportion of Corn to be ſtored up for them, as in *London* perhaps in divers places, men conſidering the low value of money, may be intreated to lend a conſiderable Sum for this good buſineſſe, if not, I know it is eaſie to command them.

3. I would have all Market Towns, and all Hundreds likewiſe, to have their proportion ſtored up, and faithfully guarded. Neither let any be terrified, as if it would be extreamly chargeable. For firſt, Now money is low, trade little, and alſo the Corn which in cheap years is oft ſold for 2 s. 6 d. 3 s. or 3 s. 6 d. will commonly, in leſſe then ſeven years, be ſold for 5, 6, 7 s. *per* buſhel, which will abundantly ſatisfie for Loan, Storage, and other charges & loſſes; but if that it ſhall be ſomwhat chargeable, yet conſider the profits that will redound to the Farmer, that he be not diſcouraged, and alſo to the Artificer, and poor Labourer, that he be not ſtarved; yea, to the whole people, that we may not be neceſſitated to devour one another, eſpecially ſeeing War begin to threaten on every ſide. And the Magazines of Corn beyond Seas, *viz. France* and *Poland* are like to be locked up from us: yea, though peace ſhould be ratified with all Nations, yet even thoſe Nations themſelves may want, and if not, yet vaſt Sums of Gold and Silver muſt be exhauſted for bread, *&c.* But the further Conſideration of theſe things I leave to them at the Helme of the State.

And thus Sir, I have written to you very largely my thoughts concerning the Husbandry of this Iſland, and partly what I have ſeen in many travels. Good Sir, be not offended at my long and impertinent ſtories, my rude language, and unmethodical diſcourſe. It was, if not to ſatisfie; yet ſomewhat to gratifie the univerſal goodneſſe of your ſpirit, and care of the publick, which God hath enriched you withal. And theſe are only my firſt thoughts, which in haſt I have hudled up together. I hope (if the Lord will ſend me life and health) my ſecond thoughts ſhall be better: But whatſoever I have done, pray look on it, as coming from one who is deſirous to ſerve you, and to advance the Publick Good, according to the Talent the Lord

Lord hath given him. Thus I commit you to the Protection of the Almighty: And reſt

SIR,

Your faithful Friend, and Servant

Anno, 1651.

ROB. CHILD.

Copies and Extracts of more Letters written to Mr. Samuel Hartlib: *They all tending very much to the great improvement not only of* Agriculture, *but of true and real* Learning, *and* Natural Philoſophy.

SIR,

The ſeveral things obſerved and ſet down during my ſtay in the Countrey, are theſe.

1. I Learned the whole Way and Art of making and ordering of Woad, *viz.* the time when they ſow it, when firſt they weed it, & cut it. I ſaw the manner of their gathering it, grinding, balling, drying it, and after ſweating, and curing it. Informing my ſelf of the whole charge and profit of it: have made divers Annotations on it, and taken order for ſome ſeed to be ſent to me, for other more compendious and profitable trials, anſwerable to the Nature and Philoſophy of it.

2. This and ſome other things, gave me occaſion to make the beſt inquiry I could of Houſewives and of Fowlers, for all ſorts of dying weeds and herbs, uſed in the dying of wool; or of nets, which I have carefully collected to improve to a more then ordinary uſe; ſome being very remarkable.

3. Among other general inquiries & adventures, I heard of one at *Ware* that carried Sea-coal; procured an errand & commendations thither; went, was civilly uſed, and ſatisfied in the truth and manner of the thing, and found the Gentleman who was the firſt Authour of it to be one *Airs*, now dead, an ingenious man

man, a great Malſter, made much profit of it: it drying Malt as ſweet as if the Sun it ſelfe did it; it is cheaper then either wood or ſtraw; and may be many other wayes applyed.

4. I went into the Iſle of *Ely*, to ſee one of the *Holland*-mills for dreyning; though ſet up there and kept by certaine *French-men*. The Invention ſeemed to me but mean and rude, and Mr. *Wheelers* way much more ingenious.

5. I ſaw at *Wickleſon* the manner of your *Holland-Sluces*. The ruines alſo of a *Gochlea*, for the emptying drayning of water, of which *Ubaldus* hath writ a whole Treatiſe. Likewiſe a pretty kind of *Pinnace* with Ordnance, ſomewhat like a cloſe *Liter*, but flat bottommed; which rowed with Wheels inſtead of Oars, imployed it ſeems formerly with admirable ſucceſſe, for the taking in of *Crowland*, and which gave me a proof of what I for many years have thought poſſible, and of very great uſe and ſervice, and ſtill think it of unknown value, if it were skilfully indeed framed, and applyed as it might be.

Cochlea a Sort of ſpiral screw

6. The Lord *F. W.* aſſured me of a Gentleman in *Norfolk*, that made above 10000 *l.* ſterl. of a piece of ground, not forty yards ſquare, and yet there was neither Mineral nor Mettal in it. He after told me, it was only a ſort of fine Clay, for the making a choiſe ſort of earthen ware; which ſome that knew it ſee him dig up, diſcovered the value of it, and ſending it into *Holland*, received ſo much money for it: it is a ſtory not to be deſpiſed.

7. His Lordſhip told me the way of making of *Spunk*, or *Touch-wood*.

8. Mr. *H.* his Lordſhip's Bayliff. ſhewed me a ſmall plat of ground, ſcarce an Acre and half, wherein he aſſured me, he had in one year 21. hundred of *Hops*; and falling out then to be ſcarce in other places, he made of that ſmall parcel of ground fourſcore pound.

9. At *Milton* I ſaw a Spring, that might have been made big enough to ſerve a large Town; which my friend *Wheeler* had newly diſcovered, and broke up; every man oppoſing him in it, and deriding his confidence, till he made it appear, and ſhamed them. Hereupon he gave me ſeveral marks of knowing

and finding out Springs under ground.

10. From Springs we converted our diſcourſe to Pipes, for the carrying along of Water under ground to any Houſe or Town; wherein he imparted ſome Secrets to me, both of the fitteſt Wood and Trees for Pipes, and preſerving them whole Ages from corruption, by ways extreamly rational, and not hitherto obſerved, or found out by any.

11. This drew on ſome diſcourſe of Woods, their differences and ſeveral applications: in which he told me many ſingular obſervations.

12. After this, I ſaw at *Melton* an excellent Model of a Garden, Orchard, and Walks, and being further curious, my friend related a witty invention he once put in practiſe, to plant an Orchard in a Mooriſh place, where never grew a Tree.

13. I caſually met with one *Boughton*, a moſt ſingular rare man, in carving or cutting out Figures in ſmall or in great Stone; and for that reaſon Servant in ordininary to the late King; who acquainted me of many excellent ingenious men, and promiſed to ſeek me at my lodging.

14. Being in *Cambridgeſhire*, I examined more particularly the Husbandry, planting, ordering, and curing of Saffron.

Some other things came in my way not without notice: but theſe are the chief. My own improvements and comments, upon all which, I ſhall more at large give you, when we meet together being alwayes,

SIR,

Yours affectionately to ſerve you.

Queries ſent into France; *about the Seed called* La Lucern.

WHen one *N.N.* was laſt in *France*, (being in diſcourſe with Doctor *D.* concerning Saint *Foin*, he was then told

told by Doctour *D.* that for the improvement of barren grounds (there was in thoſe parts of *France* about *Paris*) another Seed that did far excel that of Saint *Foin*, and that the name of that more excellent ſeed was *La Lucern*. I am deſired by a friend of mine to whom *N. N.* related this paſſage of Doctor *D.*) that by your kindneſſe, he may be ſpoken to of this *La Lucern*, and his directions deſired, where the ſaid ſeed is to be had? for what price? how much is uſually ſowed upon an *Engliſh* Acre? what time of the year it is ſown? whether it be ſown alone? or any other ordinary Corn? and with what Corn? and with what kind of land it beſt agrees? and finally, what other particulars he can direct more then is here ſet down.

The Anſwer to the Queries from Paris.

I Have been with Doctor *D.* about *Lucern*, who tells me that it groweth beſt in wettiſh grounds, that the beſt time of ſowing it in *England*, will be in *February*, at the ſame time that Oats are ſown, with the which alſo it may be ſown, but beſt alone; that to the ſowing of an Arpent, (which is much-what the ſame with an *Engliſh*-Acre) there will go twelve or fifteen pound of the ſeed, the which uſeth to be ſold here at eight or nine *Sols* the pound.

More Queries concerning Lucern.

I Deſire further to know what kind of wet grounds are beſt for it? whether Mooriſh or Clay? whether poor or rich? whether it will continue over a year in the ground? and if more then a year, then how many years it will continue without being new ſown? whether it be only good for Meadows, or for Paſture? and if for Paſture, then whether the ſheep or Cattel be ſuffered to go upon it? or whether it be carried off green as the Clover-graſſe is in *Flaunders*.

Laſtly, For what Cattel it is moſt proper?

Another Anſwer from Paris.

I Thought to have ſeut you nine pound of the ſeed of *Lucern* for the ſowing of three Acres, Doctour *D.* having told me, as heretofore I told you, that three pound would ſow an Arpent or Acre; But as I was going about it, I met with a Gentleman an acquaintance of mine, who ſome years ſince (but unknown to me hitherto) hath had ſome Acres of Meadow of *Lucern* upon his ground, to whom having caſually ſpoke of my buſineſs, and told him all that Doctour *D.* had told me about the *Lucern*; he anſwered me, that Doctour *D.* was moſt groſly miſtaken in the quantity of the ſeed required for the ſowing of an Acre; and that it would not take up three pound, but two whole Sacks, each Sack containing the full load of a ſtrong Porter; after which rate the quantity of ſeed for the ſowing of three Acres would fill a great dry-fat, the ſending whereof by land would come to exceſſive great charges, and therefore neceſſarily to be ſent by Sea in my opinion. You will be pleaſed to impart theſe things to your friend, and to let me know his final reſolution upon them, the which ſhall be faithfully accompliſhed by me; and in the mean while, I will get him a perfect and full aſſurance upon all his Queries, not from Doctour *D.* (whom I dare truſt no more in this buſineſſe, having found him guilty of ſuch groſſe miſtakes about it) but from that other Gentleman, who told me he could himſelf reſolve moſt of theſe Queſtions; but that for to be the ſurer, he thought it beſt to confer firſt with his Farmer about it. You make Apologies for putting me upon theſe Inquiries; but I pray you to believe, that at any time I ſhall moſt readily and chearfully perform any ſervice that ſhall lie in my power, for you or any of your friends, for your ſake. And I were very unreaſonable, to think troubleſome any thing that you require of me, when as continually I put you to ſo much trouble my ſelf.

The laſt Anſwer concerning Lucern.

THe Information about the *Lucern* that I have got from my Friend, being a very particular one, and containing a very full

full anſwer to all the Queſtions propounded by your Friend; is ſuch as followeth: It requireth a rich ground, but ſomewhat looſe and light, ſo as a ſtiff Clay, and ſuch other rough grounds, are no wayes fit for it; The ground muſt not be over-dry nor over-moiſt, but in a mean; yet ſomewhat more inclining to moiſture, then to the contrary. It muſt be ploughed three times, the firſt time in *October*, and the ſecond and third, towards the Spring. Naturally it doth not love Dung, and cometh much better in a ground that is ſufficiently rich of it ſelf, then that which hath been enriched by dunging; and where Dung is made uſe of, it muſt be very ſtale, and well rotten, and long before the ſowing time. It cannot endure the cold, and therefore muſt not be ſown till the cold weather and all the danger of it be quite paſt, *viz.* about the beginning or midſt of *April*. The Quantity of the ſeed, is the ſixth part of Corn, that the ſame ground will require: ſo as only one Buſhel of *Lucern* is to be ſown on that ſpace of ground, which would require ſix Buſhels of Corn. It muſt be carefully weeded, eſpecially in the beginning. And to the end, that it may take the more firme root, ſome *Oats* muſt be mixed with it, but in a very ſmall proportion. It is to be cut as ſoon as it beginneth to flower, which in the hot Countries (*Provence*, *Languedock*, and *Spain*,) it doth five or ſix times, and ſome years ſeven or eight times in a Summer; but in this Climate it uſeth to be cut twice a year, about the end of *June*, and about the end of *September*. Being cut, it muſt be turned very oft, that it may dry the ſooner, and be carried off the ground the ſooneſt that may be; and it muſt be kept in cloſe Barns, being too tender for to be kept in Reeks, open to the Air as other Hay. It is good for all kind of Cattel, as Kine, Sheep, Goats, and as well for the young ones (Calves, Lambs, Kids,) as for the others; but above all it agreeth beſt with Horſes. It is much more feeding then any other Hay; inſomuch, as any lean beaſts will ſoon grow fat with it; and to the Milch-beaſts, it procureth abundance of milk: but it muſt never be given alone, eſpecially to beaſts that have not been long uſed to it: but muſt ever be mixed with ſtraw, or with ſome other Hay; for otherwiſe it over-heateth them, and filleth

them too much with blood; and that ſo ſuddenly, as it greatly indangereth their health, and their life too; which it doth principally to Kine: to whom it is more dangerous, if too plentifully given, then to any other Cattel. After the laſt cutting, you may let your Cattel graze on your *Lucern*-fields, and that all Winter long, until the beginning or middle of *March*. Of once ſowing you will have your Meadow continue good for ten or twelve years, and until fifteen, and afterwards too, it will ſtill continue to bear; but the Herb will then notably decay in goodneſſe. Wherefore it is beſt then to turn it to ſome other uſe. Kine muſt never eat of this Herb green; but onely dried, and that moderately too, as hath been ſaid. But Horſes eating their fill of it green in the Spring, are purged thereby, and grow fat by it in eight or ten days time: If one deſire to have of the Grain, one may let ſuch a proportion of the Meadow as one will, grow up to ſeed, after the ſecond cutting, any year, except the firſt only: and when the ſeed is ripe, the tops of the Herb, with the Cods wherein the ſeed is incloſed, muſt be cut in a dewy morning, and put into ſheets, for fear of loſing the ſeed, and muſt be beat out with Flails upon the ſame: when that it is well dried: and afterwards the remaining part of the Herb muſt be mown cloſe to the ground; after which it continueth to ſprout out again after the uſual manner. The Hay thereof will keep good two or three years; and on Acre is ſufficient to keep three Horſes all the year long.

A Poſtſcript to the laſt Anſwer concerning the Lucern.

SIR,

THe Gentleman, who had given me the Note about the *Lucern*, hath told me ſince two particulars more, which he had forgot to put into it: The one, that not only to other Cattel, but even to the Horſes with whom that Hay agreeth beſt of all other beaſts; it is not to be given but in Winter, becauſe that in the Summer it will too much heat their blood: And the other, that this hay muſt be perfectly well dried, before it be carried off the ground; and to that end turned very often: becauſe that being put up with any the leaſt moiſture,

it

it will quite ſpoil much more then any other Hay. Now theſe and all the other particulars, which I have had from the Gentleman, have been confirmed to me by many others. And yet within theſe two or three dayes, I met with a Phyſician of *Rochel*, who aſſuring me that the *Lucern* was very common in his Countrey, made me a relation of it agreeing with the former, onely in theſe three points, *viz.* That of once ſowing it will continue ten or twelve years; That it is cut twice a year, ſerving afterwards for Paſture all Winter, And that it wonderfully fatteneth all kind of Cattel, but very much different from it in all the others, and in ſome of them point-blank contrary to it. For he ſaith, that it is to be ſown in the beginning of *March*; that it deſireth a temperate ground, but rather dry then wet, and no wayes fat nor clayiſh, but ſtony and gravelly; that it need not be mixed with any other Hay, but may be given alone, and all the year long; in Summer as well as Winter, not onely to Horſes, but to Cows and other Cattel. He added, that the proportion of the ſeed is the charge of a porter for four *Arpents* or *French* Acres. Which particulars I thought good to impart unto you, that your friend comparing them with the others, might make his beſt profit of them; and this *Rochellois*; (or *Rocheller*) who hath lived three or four years in *England*, thinks that *Lucern* will come admirably well in that Countrey.

NOTE.

THe meaning of theſe words--*The quantity of the Seed is the ſixth part of Corn that the ſame ground would require*,--is this, That whatever quantity of Wheat or Barley an Acre of ground would require of the ſeed of *Lucern*; you muſt take but the ſixth part of that quantity of the ſeed of *Lucern*; ſo as that ground which for its ſowing requireth ſix buſhels of *Corn*, doth require but one buſhel of *Lucern-ſeed*.

And *Arpent de terre* (which how much it is in *Engliſh* meaſure, *Cotgrave's* Dictionary will perfectly tell you) requireth ten pound of that ſeed, as ſeveral Grain-ſellers (of whom I went

to

to inquire for it) have unanimouſly told me: the ſeed being exceeding ſmall, and to be ſowen wonderfully thin. As for *Saint Foin* or *Holy Hay*, I have ſeen it grow here about *Paris* in ſeveral places, in rich fat grounds, and thoſe both high and dry, and others low and Marſhy. It is cut but once a year, much what about the ſame time of other Hay, and a great deal of the ſeed of it is required for ſowing the ground with it. But being once ſown, it laſteth ten or twelve years, as well as *Medica* or *Lucern*, wherewith alſo it correſpondeth altogether in its Vertues and Uſes.

A Copy of a Letter, relating a Proof or Experiment of an Engliſh Huſbandry.

Honoured Sir,

I Deſire your acceptance of this ſmall preſent, may be according to the real worth of the thing; not as at firſt ſight it may appear to be (*viz.*) ſtraw or ſtubble. This is I aſſure you no other then the true and real Experiment of what by the bleſſing of God, the native fertility of our *Engliſh* ground, rightly husbanded will bring forth: Nay I can upon moſt probable grounds affirm, that had I uſed all the Art and Care which I could and might have done (had I not been otherwiſe taken off) it could hardly have failed to have been double, treble, or quadruble to what it is. And it is alſo moſt true, that any good ground well managed, may yeild one, ten, an hundred, *&c.* Acres, in which there ſhall be very many ſuperiour to the biggeſt root of theſe, and hardly one inferiour to the beſt but one; by which account it will eaſily appear, how much beyond the old way, this is the increaſe, there being between two and five quarters on the Acre; and the product of this way will be rarely under ten quarters, not rarely ſixteen, or twenty, and the ſame for moſt Grains; yet will this dull Age as to goodneſſe not believe it without ſome teſtimony, and perhaps ſcarce ſuffer themſelves to be convinced by this ſo eminent an experiment; wherein it plainly appears, *That out of one ſingle* Barley-*Corn is ſprung about* 80 *Ears, of which near* 60 *had, ſome*

some 36, 34, 32, 30. *and hardly any lesse then* 38. *which in all is above* 2000 *for one:* And truly the charges to be bestowed on an Acre of this sort is no wayes double to the common way. Accept it therefore, and reserve it as a real rarity, and a jewel onely fit for a Publick and Pious Spirit, as yours is: till I shall by Gods assistance be able next year to produce you more abundant examples of Gods wonderful power and bounty that offers, and mans ingratitude that neglects, or refuses such honest means, of the truest and most justly gotten humane wealth, honour, and happiness.

Your most faithful and obliged Friend, and Servant.

September, 26. 1650.

C. D.

A Conjectural Essay upon the fore-going Secret or Experiment of an English Husbandry.

My Dear Friend,

BEing the other day among a knot of great Husbands, and telling stories of such like Experiments and Improvements. I remembred something that seemed very remarkable concerning a very fortunate attempt in Husbandry, made heretofore by Sir *John Culpepper*, who they commended at least for a man very sagacious in things of this nature. He it seems sowed a round parcel of Wheat, about the Month of *July:* and turned in sheep afterwards to eat it, until about *All-hallontide*, keeping it very low till the cold and winter began to come: And without doing any thing else to it, he gained so goodly and admirable a Crop of Wheat the next year, that *Kent* scarce ever saw the like, it growing in those parts almost to a *Proverb.* As great a Crop as Sir *John Culpepper* had.

Sir, This Story gave me an occasion by my self to meditate on your Friends. Mr. *Dymock's* great Experiment of His Pease and Barley, and remembring he did nothing to the seed, nor

to the ground, but somewhat after it was come forth of the ground; I began to consider Analytically what it was possible for man to do to Plants after they were come out of the ground; And I satisfied my self, that a man could but either dung them, water them, weed them, remove them, succour them, keep them low by eating, pruning, or cutting them, or lastly spread their Roots by rowling them. And though there be some other managements by Glasses multiplying of light, &c. Yet I imagined they were too subtle and costly to take place here.

1. For dunging and watering them, they were clearly things done to the Ground it self, as well as to the Plant.

2. For weeding them, though this oft proved a great improvement, and bettering of Plants, yet I saw not how it could make so great an increase or multiplication of the Grain, as was in Mr. *Bymacks* Experiment.

3. For removing them, and taking off the suckers, though this be a very necessary management in taller Plants, and serves to make them much more vegete and lusty, yet I saw not how this could take more place in Barley, and such small grain then grafting.

These Considerations made me pitch upon the two last, and of the two rather upon Rowling, or the like Art, for the spreading the Roots of it, then upon the other, of eating, feeding, or cropping it.

1. First, Because the former Experiment of Sir *John Cutteppers* seemed to me an improvement of the Plant, onely by the giving it opportunity, the better to fasten and spread its root. Which the length of time of its being in the ground, the cold of the season, and trampling and lying down of the sheep, seemed all to confer unto. All which Rowling I thought might in some measure perhaps supply.

2. It is an Observation among some bigger Plants, that their Roots are answerable to their Heads, intimating that a small root could not have a large and bushy head, no more then a strong and fairly spread root could have a small and spindle head. And truly this Rule in greater Plants, seems more ne-

cessary

ceſſary in ſmaller: for how ſhould we think there ſhould be many ears or ſtalks from one Grain upon a ſmall and ſingle root; for where could there be a place for them? And how ſhould we think a Root to be ſtrong, ſpreading, and ſucculent, and yet not endeavour Germination in the ſeveral parts and joynts of it; eſpecially in haſty, growing, Annual Plants?

I therefore conclude ſuch a ſuper-fortation of ears muſt neceſſarily proceed from an improvement by the Root, where nothing was done either to prepare the Ground, or the Seed. And that this ſpreading of the Root is probable to be beſt effected by a Rowl, or ſome ſuch like thing.

3. I might adde to this Conjecture, the common Experiment of Camomil, and ſome other low creeping Plants, being rowled in dry weather. As alſo an Experiment that I once heard of a Gardiner, who raiſed a great Eſtate by his Husbandry of Turnips, which was by keeping them low for a certain time, by which they grew the ſooner big and ſweeter: The like is uſed in ſome Countries to Potatoes. To all which I might adde the plain defect of this Rowling in Husbandry to any ſort of Grain, which alſo may give the greater occaſion of finding a remarkable benefit and improvement upon the uſe of it.

However Sir, Being ſo much ſatisfied as I was of the thing, I could not but give you this my Eſſay upon it, and Conjecture, the rather becauſe in the more dry or ſtiff Grounds, as alſo in ſeaſons indifferent for moyſture and drineſſe. If this have not been yet tryed, Me thinks it were fit to be uſed.

To your inquiry, after which I ſhall therefore leave it, and ſhall be,

SIR,

Your very true Friend,

B. W.

An Extract of a Letter from Amſterdam, *dated the* 28. *of* November, 1650. *with another Experiment of a* French Huſbandry

SIR,

I Am much obliged unto you for ſending me the *Diſcourſe of the Braband Huſbandry*, which I have peruſed. Not long ago I was told of certain men which would fain have morgaged ſome thouſand Acres of Heathy Grounds, which lay here and there as Commons. But the late Prince of *Orange* by the advice of his Councel, durſt not entertain any ſuch Propoſitions, the lands belonging to the Commonalty. On the other hand the undertakers would not be contented with leſſe for imparting of their Secret. It appears unto me by all circumſtances that it was the ſame deſigne of *Huſbandry* with yours, the parties, if I remember well, being *Engliſh* men. From *Paris* I am advertiſed (for certain) of one, who did laſt year, 1649. ſet ment one Grain of Wheat, which this year hath produced him 114 Ears, & within them 6000 Grains, which is more then 80 Ears, and 600 Grains of your *Engliſh* friends. This year 1650. he hath a great many fermented and ſown.

An Anſwer to the foregoing Extract of a Letter from Amſterdam.

SIR,

I Have received from you a Relation of a very great and wonderful production or increaſe, which your Friend at *Amſterdam* relates to be done in *France*. I am far from leſſening the admirable greatneſſe of that perſons skil and ſucceſs. Only ſince I find my ſelf taken notice of by the ſame party, and the Experiment I made the laſt year of Barley, weighed in the ſcales with this, and found too light; I ſhall take leave to ſay that (beſides all difference that is or may conceived to be betwixt the ſoyles; that of *France* hath a manifeſt advantage in the Elevation and powerful Operation of the Sun,) That it is probable he did uſe all poſſible means both to the Ground an

and Seed, to make them both fruitful, which I did not at all; but quite contrarily I choſe the worſt ſeed I could procure; and my ground was as barren as any whatſoever in the parts adjacent. I added nothing to either; all I did was after the blade was ſprung up. And whereas your friend mentions 600. out of 80. ears, thoſe ears contained one with the other at the leaſt thirty ſingle Corns, which 2400. That beſides that, *Wheat* is no whit inferiour to *Barley*, but rather more inclined to its proper nature to branch and ſpread: it is alſo allowed as long time again to grow, and therefore may better ſpread to many ears then Barly. That my ears of *Barley* rated at thirty, one with the other, (which they were at leaſt, ſome having 58 a thing I ſuppoſe rarely (if ever) ſeen in *England* before) are full as high as his *Wheat* ears rated at 52. And the ſeeming great difference between 2400 and 6000. when looked into, will prove not to be in the number of ears, which differ no more then as fourteen to ten, but in the nature of the Grains, there being univerſally as many more in an ear of Wheat as in an ear of Barley. That if (as it is moſt like) he in *France* did only try concluſions, to what height Nature might poſſibly be ſerued by Art, and that what is here related, was the effect of that trial; that holds not compariſon with mine, which is generally practicable, without any conſiderable expence of time or ſtock more then in the common-way. Laſtly, I affirm, in all poſſible humble reverence and ſubmiſſion to Gods good pleaſure, power and providence; that when I ſhall make uſe of good Seed rightly prepared, good Land in right condition, and all other helps which I know and can uſe; I ſhall not doubt for ſmaller numbers of the ſame Grain, (*viz.*) Wheat, to produce 200 or 300 ears, and in them 10000. 12000. or 15000. Corns, (and ſomewhat like that, for whole fields together, and that here in *England*,) howſoever let us alwayes remember to give all poſſible praiſe to God, *whoſe bleſſing only makes rich.*

SIR,

I am your faithful Friend and Servant. C. D.

Another Letter from Paris, *diſcovering the Secret of the ſtyled* French Husbandry.

SIR,

I Do with much impatience deſire the Treatiſe or Diſcourſe publiſhed by you about the *Brabant-Huſbandry*, and do very much admire the induſtry of that *Engliſh* Gentleman your Friend, who hath found out the wayes of making Corn multiply ſo prodigiouſly. The *Pariſian* Experimenter of Corns multiplication I know not: but a friend of mine very well acquainted with him, aſſureth me to have had the following deſcription of his ſecret from himſelfe; and to have ſeen the experience of it very fully in the year 1649. not in any great quantity, but in a Garden, onely for trials ſake.

Good for nothing

Pour into quick or unſlack't Lime, as much water as ſufficeth to make it ſwim four inches above the water: And unto 10 l. of the ſaid water poured off, mix one pound of *Aqua vitæ*, and in that liquour ſteep or ſoak Wheat (or Corn) 24. hours: which being dried in the Sun, or in the Air, ſteep again in the ſaid liquour 24 hours more, and do it likewiſe the third time; Afterward ſow them at great diſtances the one from the other, about the diſtance of a foot between each grain. So one Grain will produce 30. 36. 38. 42. 52. ears, and thoſe very fruitful, with a tall ſtalk, equalling the ſtature of a man in height.

Another Extract of a Letter from the Low-Countries.

SIR,

THeſe are to give you ſpecial thanks for communication of the *Pariſian* Experimentors Secret. Water (if he means cold water) poured into quick and unſlackt Lime, cannot work much in one hour upon the Lime; but if it be boyled with it, and that the water be poured alwayes afreſh upon the Lime, then it will come to be ſtrong at laſt, that an Egge may ſwim in it, as I learn'd by tradition from Doctor *Hartmannus*, but could never make any trial of it, for want of unſlackt Lime in the place where I live. This perhaps may be yet better; but experi-

ence

ence goes beyond reaſon in theſe caſes. The often macerating or ſteeping, and drying of Grains I like very well. I have only according to Maſter *Gab. Platts* direction ſteeped them 24. hours in turned or tainted Rain-water, and Cow-dung, and afterwards ſown them thus wet, which on ſandy grounds hath produced ſuch goodly Corn, as if it had been very good Land. Some here uſe *Salt-Peter*, which alſo doth much good; but is found likewiſe in Sheeps-Dung, as may appear by its fertility. I have loſt the Book of Husbandry of Mr. *Plats*, which was called, *A Diſcovery of infinite Treaſure hidden ſince the Worlds beginning*. Whereunto all men of what degree ſoever, are friendly invited to be ſharers with the Diſcoverer. For having lent the ſame to a friend, that it might be tranſlated into *High-Dutch*, I could never ſee it again. I am told it is out of Print. But if you could help me to another, you would do me a pleaſure. I have nothing to adde for the preſent, but that the *Genius* of this Age is very much bent to advance Husbandry; and that in all Countries I hear there are found Gentlemen, that ſtudy profeſſedly theſe improvements more then in former times. I reſt alwayes

SIR,

Yours, &c.

Another Letter expreſſing the reaſons why the Experimenter of the Barley-Corn, *thinks it not fit or expedient to part with his ſecret as yet, for a more common uſe.*

SIR,

I Find daily more and more, that it is too true, that moſt men love money, that they even worſhip it in their hearts, as the only *Summum Bonum*. I need not go far for proof, ſince they have brought one to my hand. That (having ſo fair & juſt offers made in order to the Corn-buſineſs; as I have preſented to them

them by your hands,) will by no means (though ſo very much to their own profit and the Publick Good) part with their monies; and yet ſtick not to demand (in effect) the diſcovery from me of that talent of knowledge, which God hath made mine by his free-gift; as the reward of my induſtry, and faithful love to my Native Countrey; An eſtate (if I miſtake not) better gotten then by any of the common means; by which men grow rich daily. Surely the commodities cannot be leſſe then equal. The moſt wiſe and vertuous men that ever lived, have preferred Art, Induſtry, and Ingenuity far before money. Money (eſpecially the abuſe of it) is become the very poyſon of the world, againſt which Art and Induſtry is an Antidote or Cordial. Mony is counted and enjoyed by a thouſand thouſands, Art and Induſtry but by a few. And things of excellent uſe are accounted Jewels, eſpecially when rare and ſcarce. The Profeſſors of Art and Induſtry, beſides their private aim alſo at a Publick Good: theſe prefer their private gain (too often) before the being and well being of the whole world; nay of their own ſouls. Theſe are ever ready to part with invaluable treaſures upon eaſie conditions: Thoſe will not upon any conditions whatſoever (but ſuch as pleaſe themſelves, or are full of oppreſſion) part with their monies, (no not to ſave a Brothers, or hardly a Fathers, or a Childs life.) And finally if they judg it improvidence to part with a little of their eſtates onely for a time, to return again to them ſhortly, like *Noah's* Dove with an Olive branch, a double branch of Peace and Proſperity: I deſired to be excuſed, if I upon better grounds hold it prophane, to ſell a better right then a birth-right for leſſe then a Meſſe of pottage; even for juſt nothing, and for ever. I can never forget the exceeding great ingenuity to the world, ſhewed and given by Mr. *Gab. Platts*, as will more fully appear, when you ſhall have printed thoſe writings of his which he left to your truſt and cuſtody, and the World's baſe ingratitute that let ſuch a man fall down dead in the ſtreet for want of food, without a ſhirt to his back; none (but your ſelf that want not an enlarged heart, but a fuller hand to ſupply the worlds defects) being found with ſome few others, to adminiſter

miniſter any relief to a man of ſo great merit. In a word, that God that hath forbid *to muzzle Oxe that treads out the fodder*, hath appointed every man to uſe his bleſſings next to his glory for the providing for and preſervation of his family, which he that can do, and *doth not*, *is worſe then an Infidel*. I dare not give away this means of obtaining outward bleſſings to my ſelf and family, till I have found a way to make it inſtrumental to that end; and that end once effectually attained to, I dare not deny Gods mercy and bounty to me, nor longer reſtrain the publick uſe of his univerſal good: I remain

SIR,

Yours,

C. D.

A Secret practiſed with very good ſucceſſe in England,. *concerning ſowing of Wheat, to prevent it from being Smutty.*

FIrſt take your Wheat, pour the ſame into a tub of water, and ſtir it about, take off all the Corn that ſwimmeth upon the water, and pour the reſt upon a floor, letting the water run off. Then make a ſtrong brine of Bay-ſalt, and pour ſome of the brine on the Corn upon the floor; and take to halfe a quarter of Corn, half a peck of Salt, and ſtrow it on the Corn, and ſtir and mix it continually; as you pour thereon the brine, and ſtrow the ſalt thereon, until the Corn be all wet and overſtrowed with Salt.

Then take to a half quarter of Corn, half a buſhel of unſlack'd lime, and ſtrow that likewiſe over the Corn, mingling it well together; which done you may ſow the ſame the next day. The brine muſt be cold when you pour it on the Corn, and you muſt prepare no more Wheat then you intend to ſow next day.

Another Secret *practiſed in* Germany *for the enriching of* Meadows.

A *Meadow* yeilds ſix times more *Hay*, when it is turned up with a plough, and ſown thick with aſhes burnt out of

the ſubſtance thereof, but the rain muſt fall firſt. Afterwards ſow your *Meadow* with the ſeed of *Treſoil*, and plough and harrow them in. The firſt graſſe which groweth thereon, let it be very ripe, that the ſeed may fall off it ſelf; then let ſome go over it, and with rakes ſtir it, that it fall out. Afterwards let it be mown off, and carried to a certain place where it may be dried, ſo the Graſſe will grow preſently again, and may be mown again in three weeks.

How to make Ruſhy Ground *to bear* Graſſe.

BReak the *Ruſhy Ground*, and rake roots and the ruſhes together, and burn them or carry them away; then ſpread upon that ground, *Turffe-Aſhes*, or *Pigeons-Dung*, *Chalk* or *Lime*, according to your ground. Try of every one of theſe upon a little plot of your ground: you may uſe other *Aſhes*, *Marle*, or *Dung*, for experiments: and that which you find doth kill the *Ruſhes* and other *Weeds* beſt, uſe it: you are to make Gutters or Drains to carry away the water from the ground: you may deſtroy *Ruſhes* or *Fern*, if you will; but cut or mow them down in the beginning of *June*, and ſo uſe to do it two or three years together at that time.

For planting or ſowing Walnuts.

IN the ſeaſon when they are full ripe on the trees, a few days before they would fall, as near as can be gueſſed, let them be gathered or beaten off; and in the green huſk, or without it, put them into good ordinary earth in a barrel or basket: So let them continue until the beginning of *March* following: as ſoon as that month begins, get as much warm *Milk* from the *Cows* as will ſteep them 24 hours: after they are ſteeped, ſet them in ground well digged, and judged natural for ſuch fruit, with their little end, or their prickled ſharp end upwards, about three or four inches deep in the earth, and not one of 28. will fail, as hath appeared by experience. This may make dry *Walnuts* alſo prove trees, the *Nuts* uſed as above-ſaid, as far as may be,

be, ſet them near one foot aſunder, and in a right line to weed them. The *Walnut* breeds good *Timber*, good *ſhadow*, good *ſmell*, good *fruit*. At four years growth tranſplant them.

Mr. Lanyon's *Deſcription of the uſual manner of planting and tranſplanting (according to that of* Flaunders*) of thoſe Trees called* Abeales, *imparted for Publick Good.*

THey are firſt planted from any, even the leaſt part of the Root of the ſame Tree: you muſt devide the root, by ſlipping each part from the other, and not by cutting it in ſunder: you may take thoſe parts from thoſe trees whileſt they grow, and without danger to them, rob them of all the ſmall ſprigs of the root, and leave onely the *Maſter-Roots*; but the moſt uſual way is to multiply them, when they are tranſplanted; which time is at their growth of five years: their ſeaſon is in *March*. They are firſt planted in the way of a *Nurſery*, in looſe earth, moiſt and ſandy, or inclining to it: their diſtance is ten inches one from another (the earth being firſt prepared as for a *Garden:*) you are to make holes with a ſtick, the depth of the length of the part you have to ſet, ſetting him ſo that you may onely ſee a part of it above ground, the earth being cloſed about them; they are to be kept weeded as any other plants. The ſecond year in *February* you are to prune off all from the *Maſter* or *Middle-ſhoot*, and ſo to the third and fourth year: the fifth you may tranſplant them, ſo as they like the ground of their *Nurſery*. Their uſual diſtance one from another is ten foot: you may drive a ſtake with them when you tranſplant them, to ſecure them ſtiff againſt the wind; for that they will grow very tall in thoſe years, and ſo be much expoſed to the winds. They may without much prejudice (to Corn) be planted in the furrows where it grows; ſo as the ground be moiſt, and you keep them well pruned, and leave onely a buſh at the top of the tree. No ſtiff *Clay* grounds will admit them to thrive, they will grow in moiſt *Clay* ground, but onely in height, and will not burniſh for want of room to extend their roots. This tree if he likes his ground; will be at full growth in twenty years. He is valued in *Flaunders* after

ſeven years growth, worth every year 12 d. until his time be up. He grows very ſtraight without boughs, onely a buſh on the top, and ſo exceedingly well becomes a *Walk*. This *Timber* is alſo uncomparable for all ſorts of wooden veſſels, eſpecially *Traies*; *Butchers-traies* cannot well be made without it, it being ſo exceeding light and tough. Some years ago there were ten thouſand at once ſent over into *England*, and tranſplanted into many *Counties*. Mr. *Walker* at Saint *James* can give the beſt account of them to all ſuch as deſire further to be inſtructed in this particular.

Another Direction for the planting (underſtand the ſecond Planting) of the Abele-Trees.

LEt your Plants be one year old, ere you remove them to the plat where they muſt ſtand in the earth, till they be tranſplantable.

Cut away their roots in ſuch a manner, that the cuts may fall flat againſt the earth: but ſpare the little roots, and the ſmall ſprigs or beards that hang about the root.

Cut off the upper part ſo ſhort, that they be but little more then half a foot long. Upon which remainder, you ſhall ordinarily have five or ſix buds; ſometimes more, ſometimes fewer; but what ever their number be, it is beſt to leave your plants all of one length.

The Land in which you mean to plant them, muſt firſt be well laboured, and then opened ſo deep, that the Plants may ſtick up but three inches above the earth, if it be dry; but if your land be moiſt, you muſt not ſet your plants ſo deep.

Plant them four-ſquare, ſo that every Tree may ſtand one foot and three quarters (that is, 21 inches) from every one of his four next neighbours, Thus,

. . .
. . .
. . .

In the firſt year, take away or cut off no ſhoots from them, but

but thoſe that grow out half a foot from above the earth.

The time of planting is when the violence of froſts is ceaſed.

New Obſervations concerning Abel-Trees.

The leaſt *Spawners* from the root will grow. Any twigs cut from the body will grow. They will grow (in two, or at moſt in three years) above the reach of the talleſt man.

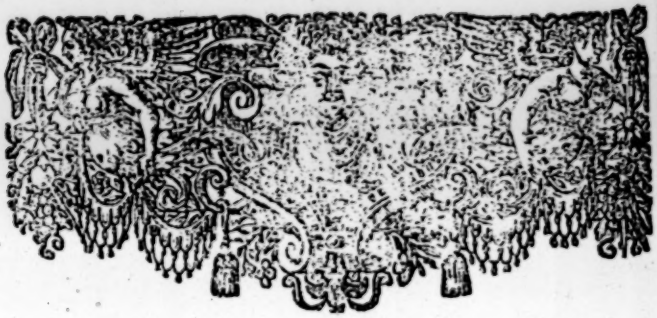
A Set planted by Maſter *Walker*, Gardiner of Saint *James*, not above twelve, or at moſt thirteen years ſince, is now as big as his middle.

Item,

Two Rows of Setters, three inches about planted (the rows) twenty four foot aſunder in 47. did by the end of the year 50 meet with their boughs croſſe the walk.

Item,

An *Abele-Tree* at *Sion*, lopped in *Februarij* 51. by the end of *October*, 52 put forth branches as big as a mans wriſt, ſeven, ten foot long.



Dr. Arnold Beal's,

Annotations upon the Legacy of HUSBANDRY.

Paris the first of July, 1651.

I Give you moſt hearty thanks for your Work of Husbandry, the which having peruſed inſtantly, *à capite ad calcem.* I find it a moſt excellent piece both for the improvement of Husbandry, and of the other Commodities of the Countrey, as likewiſe for the Natural Hiſtory of *England*, and have learned many particulars by it, which before were unknown to me. But I remember to have heard of a *Dutch* Merchant in *Dublin*, that the *Dutch* uſed to fetch their Black-lead out of *Wales*; whereas you ſay it is found in *Cumberland*, and no where elſe in *Chriſtendom*. I pray you to let me underſtand, whether you have any particular knowledge of that Mine, of the nature and properties of that Material, whether it ſerveth for any other uſes, then to make pens of, and to neale earthen veſſels withall, and how for this uſe Potters do prepare and apply it.

Paris

Paris, the 12 *of* July, 1651.

I was hugely taken with the large Epistle in your Legacy upon the first reading of it, and am more now upon the second, which maketh me sorry, that the Authour should give any advantage to carping wits; as he doth here and there in some of the *Parerga*; upon which I shall freely give you my sense, that being commmunicated to him, he may mend them in the next Edition, if so he see it fitting: What he saith out of *Helmont*. *page* 13. *The smuttinesse of Corn, and the foul disease to have begun in* France, *together about* 1530. *and the latter to have had some original from the former.* To say nothing of the small credit of that Authour, even in things subject to his own knowledge and experience, I being able to convince him of most palpable lies out of his own writings, a more credible Author then he should not be alleadged, much lesse heeded; if opposite to so notorious a truth; as that of the foul disease, it's original in *France*, as well as in *Italy* and *Spain*; full 36 years sooner then *Helmont* sayes, *viz.* in the year 1494. and nothing could be advanced more absurd or ridiculous in the judgment of all sound Physicians, then to attribute the original of that disease in any wise to smutty Corn, as he doth. The imperfection of smutty corn, consisteth altogether in a similar distemper, and that of the more spirituous part, consequently not at all subject to the eyes, and so not to be found out by *Microscope*, to the contrary of what our Authour supposeth, *page*. 15. *The corn sown in July, produced such an increase, page* 18. I cannot imagine, how Corn sown in Summer can come to good, or what humane wit or skill can hinder it from running up; and spending it self, before the coming in of Winter. His Philosophy *of the blacknesse of the Moor-loghs*, as communicated by the blacknesse of the earth or turff, *page* 25. is no wayes receivable. I find him too credulous, *page* 27. to *Glauber*, and others, about those Mountebank boastings of *brewing without malt, and of drawing great store of Aqua-vitæ out of the imaginary Beer; and other unfit materials. The opi-*

nion

nion of the Suns deſcending lower, page 30. although juſtly, as I hold it rejected by *Mæſtlinus, Longomontanus, Keplerus, Morinus, Ismaldus, quibus omnibus præit Ptolomæus*, ought not to be ſpoke of ſo contemptuouſly, ſeeing that one of the greateſt Aſtronomers that ever was (*viz.*) *Copernicus* didfirſt advance it, & *Reinholdus*, another moſt famous Artiſt approve of it, and he having made the loweſt deſcent of the Sun but of 35 minutes, which is but a little more then half a degree; I know not what makes our Authour ſpeak of the Suns deſcending many degrees lower. It is true, that thoſe 35 minutes amount to many thouſands of miles, which expreſſion therefore would be both more pertinent, and more ſutable to the vulgar capacity of moſt Readers, then that of minutes or degrees; This is what I have obſerved till *page* 30. further then which I am not yet come: And foraſmuch as I have never an *Engliſh* Dictionary here, I would be glad of the Expoſition of ſome *Engliſh* words not ſo well underſtood by me, as howing (ſo oft ſpoke of) and the How; Wheats-lodging, *page* 18. Cankerberries, *page* 27. and the difference betwixt Haws and Hips; *page eadem*, I having ever taken them to ſignifie the ſame thing. I do not know neither, what are the piles on Marſhes ſides, *page* 25. and am ignorant of the Hiſtory of *Glaſſenburies-Hauthorne*, mentioned *page* 4. about which I would willingly receive ſome light.

Paris, the 19 *of Auguſt.*

AN *Engliſh* Gentleman, who many years hath lived, and been a Houſe-keeper in *Devonſhire*, as he was yeſterdy reading your Legacy at my houſe, having lighted on that paſſage, *page.* 26. about the making of Cyder, told me, that the ſecond way there mentioned is not a making of Cyder, but a certain preparation of it already made, uſuall alſo in wines and other liquors, eſpecially thoſe that are to be transferred a great way by Sea; and as for the firſt, that he never ſaw it practiſed in *Devonſhire*, where Cyder is very common; and where himſelf uſually made forty Hogſheads every year; but that the way

way of making Cyder in that Countrey uſed by all men is this; Having reduced their Apples into Maſh, by turning upon them a kind of a Milſtone ſet edge-wayes in a wooden trough, they preſently carry them to a wooden preſſe of that bigneſſe: as in one hour they will preſſe out two Hogſheads of Juice: the which having let ſtand a day or two, and having taken off the black ſcum that ariſeth in that time, they tun it, and in the Barrels it continueth to work ſome dayes longer, juſt as Beer uſeth to do. He told me divers other particulars about Cyder, partly of his own, and partly of that Countreys common obſervations, the which I forbear to relate, becauſe I believe that *Markham* hath ſpoke of them.

Paris the 16 of September 1651.

SEing by your laſt, you deſire the continuation of my Annotations upon your Legacy, I muſt tell you that I believe your friend hath not been well informed, *page* 23. about the Countreys there named by him; for the ſending of *Walnuts*, *Quinces*, and *Cheſtnuts* into *England*, and that it will be found upon better enquiry, that theſe commodities do come into *England*, if not ſolely, yet abundantly: the firſt from *Holland*, the ſecond from *Zealand*, and the third from *France*; and as for ſmall nuts, except he ſpeak of ſome exquiſite kind of them, I know not why one ſhould run ſo far as *Spain* for them, ſeeing that *Ireland* aboundeth in them above all Countreys in the world, *page* 27. *I know an ingenious man, who can without malting, &c.* If you and your friend will be ruled by me, you ſhall not take this upon *Glaubers* bare word, nor any of thoſe other magnificent promiſes; which he maketh in that boaſting Catalogue, till he have made them good by the effect, leſt the ſimilitude of the Prophet *Eſay* 29. 8. be verified in us, *page* 28. *Grafting, Inoculating, &c. a Gentleman will learn in two hours*, to learn it to ſome purpoſe will require more then ſo many dayes, if not weeks, *expertus loquor*: *page* 30. *We find Vines flouriſhing many hundred miles more towards the North* [*than* Alſace] *both in* France, Loraine, *and* Germany: If for many

hundreds, he had ſaid one hundred miles, he might perhaps have made that good, and yet not that neither in all the three Countreys here named, I am ſure not near it in *Lorain*, and very hardly in *France*: *page* 31. *Vines grow ſixty miles on this ſide* Paris *at* Beaumont; *Beaumont* is but eight leagues, or ſixteen *Engliſh* miles North from *Paris* and *Beauvais*, (which and *Beaumont* is the moſt Northern part of *France*, where any Vines grow,) is but twice as far, being diſtant ſixteen leagues from *Paris*. *Ibid. Theſe places which are even as far North as* England, nothing near none of them; *page* 36. *linea* 3. *pack in ſo many plants, &c.* I have ſeen moſt of the Vineyards about *Paris* for many miles round, and never ſaw any ſuch thing, very few having any thing in them but Vines, and where any thing elſe was, I ſaw onely a few Peach-trees here and there, too far aſunder to do any great harm to the Vines or Ground; 37. *To ſhort poles, as we do hops*, out of one Hop-pole you may make three Vine-poles. As for length; wherefore they ſhould not be ſo yoked together: *ibid. In* France, *ſo ſoon as they have preſſed out their liquour with their feet* [preſſing with feet is not uſed in all parts of *France*, and utterly unknown in theſe Northern parts of it,] *they put it into Hogſheads* not at all till it have wrought firſt in Keeves: 39. *from theſe who would deſtroy, &c.* I could wiſh that bitter and exaſperating expreſſion in the behalf of my Countrey-men might be ſpared. "If I "would make Obſervations upon thoſe paſſages, which have "ſomething of good and excellent in them, as well as upon "them, where I conceive ſomething is to be mended, I ſhould "never have done, the Book being full of them from one end "to another; yet I cannot let paſſe with ſilence thoſe words, *page* 44. *The Sun and Dew ingender a nitrous ſatneſſe*, they pointing at the unfolding of one of the greateſt Myſteries in Nature, unknown to moſt of them if not to all; who profeſſedly do deal in the inquiries of that noble Science; but to ſpeak of this to the full were not the work of a Scholion, but of a whole Treatiſe, concerning the Improvement of Land by Sea ſand; of which *page* 45. you will find a confirmation of that in *Irelands Natural Hiſtory*, and it is very much uſed in *Devonſhire*,

vonſhire, with admirable ſucceſſe, not onely equal to, but even beyond Lime it ſelf, as I have been told by that Gentleman, whoſe Obſervations concerning Cyder I gave you formerly; *page* 46. *All fertility proceedeth from ſalt, add. adum.* Made unctuous or oily, and ſpirituous, *id eſt uno verbo* nitrous, *nam ſale mero nihil magis inimicum fecunditati*; 47. *In* Holland *they as carefully preſerve the Cows urine, as their Dung to enrich their land*, they preſerve it no otherwiſe then is done in all other Countreys; *viz.* mixed with the Dung, and joyntly with it carried out to the Dunghill, *ibid. We muſt have it* [paper] *from* Italy, France, *and* Holland; I believe *Italy* ſendeth out little paper, either to *England*, or to any other Countrey, and as for *Holland*; it hath none to ſend, but what it ſelfe getteth from abroad, there being none at all made there, (*viz.*) In *Holland* properly ſo called, nor in any of the other Provinces that I know of, but onely ſome in the *Velaw*, a part of *Gelderland*, and in *England* there is good ſtore made, both towards *Oxford*, and in ſome other places, though not enough for to ſerve the Nation.

Paris, the 22. *of* October, 1651.

HAving continued to read on in your Legacy from *page* 48. where I left with my laſt Annotations, I find nothing that needeth any Animadverſions, but theſe few following things, *page* 60. *a kind of* Salix *called by them* Abel-tree, the Tree called an *Abel* in Dutch is no way a kind of *Salix*, but is *Populus alba*; *Ibidem*, *If we believe their own Authours*, *&c.* I know not who thoſe Authours are, but I am ſure that who ever hath ſaid ſo, hath ſaid moſt untrue; for the profit that ariſeth to *France* by Silk, cannot in the leaſt part come in competition with that of Corne and Wine. *Ibid. In France*, *which differeth not much from the temper of England*; Silk is a ſtranger to thoſe parts of *France* that agree with *Englands* temper; 69. I could wiſh thoſe words, *linea* 3 *&* 4. *We know nouriſheth them*, to be left out, as devoid of all truth, if applyed to the Inſect in queſtion: *page* 70. *linea* 2. *Let him read* Boneil.

adde *Andream Libavium, qui peculiari Tractatu inserto parti secundæ Singularium: fusè ac diligenter admodum omnia ad Bombyces spectantia pertractavit: militerq́, Olivier de Serres libro* 50. *Theatri Agriculturæ.* Among the things which *page* 70. he thinketh might be transplanted profitably into *England*, I could wish the omission of the three first, (*viz.*) *Sassafras*, *Sarsaparilla*, and *Snake-weed*, the which I greatly doubt would hardly be made to grow there at all with any industry, but sure I am, never to any purpose: and the same I believe about their Cedars and Pines. *Medica veterum* is without all peradventure the Plant now known under the name of *Lucerna*; wherefore it ought not to be ranked as it is, *page* 80. amongst the Plants now unknown; *Quid esset lupinus veterum, nemo unquam Herbariorum quod sciam dubitavit quare omittenda ejus mentio inter herbas controversas, page* 80. *Page* 81. *What seed, grout*, or *grutz*, is made of the same seed, and in the same manner, as that which in *English* is called *Groats*, (*viz.*) of *Oats* and of *Barley*; of those three sorts of Cheeses which he reckons up, *page* 81. onely the second and third are made of Cows milk, and therefore his expression is too general, and what he sayes there, which are far better then our ordinary Cheeses, is true indeed; but as true it is, that they are far better then their ordinary Cheeses: and as true likewise, that the best of those Cheeses are no better, nor so good by far as some *English* Cheeses. *Verbi gratia Chedder-Cheeses.* He is much mistaken, if he believeth that all those things reckoned up. *page* 82. will grow in *England*, at least to any purpose, especially *Rice*, *Cork*, *Scarlet-Oak*, and that Sentence of *Virgil*; *Ut quid quæque ferat regio, quid quæque recusset.* Justly termed an Oracle by *Pliny*, doth not depend wholly (as our Authour seemeth to take for granted) on the Climate, and the latitude of Regions, for were it so, *Dictamnus, Laser, Cinamonum, Balsamum, Myrrha, Camphora, Stirax, Mastick, Benjovin, Caryophylli, Nux-Muschata*; and an infinite number of other Plants would not be, and from all time have been confined to such Territories as they are; all the Industry of man, and the power and wealth of greatest Princes never having been able to make them grow;

at leaſt not to make them fructifie out of their native Soils: wonder alſo to find *Linder*-trees named in the Catalogue of Plants, which he would have deni zon'd in *England*, ſeeing that great ſtore of them and very good by ones have been growing in ſeveral parts of the Land, many years ſince even in & about *London*, as at *Exeter-houſe*, *Wimbleton-houſe*, &c. and there beſides *Sherewood-Forreſt* in *Nottinghamſhire*, aboundeth in them naturally.

Paris, the 18. *of* November, 1651.

I Come now to your Legacy, whereon theſe words, *page* 84. *It caſteth up Jet and Amber*, I muſt tell you that as it is moſt certain, that of Jet, good ſtore is found on ſome part of the ſhore of *York-ſhire*, ſo I dare ſay that upon inquiry it will appear, that never any *Amber* or *Succinum* was caſt up there by the Sea; that being a commodity ſo peculiar to *Spruce* or *Pruſſia*, as the Sea was never known to render it in any other Countrey of the world whatſoever, *page* 85. At *Dover* they make brick of Sea-owſe, a thing very incredible to me. In *Cumberland*, out of a certain kind of ſand they extract ſalt; It were worth the while to tell in a few words at leaſt, how they proceed in the doing thereof; Not onely notice ſhould be taken by the Husbandman, or Countrey-Gentleman of the different colour, odour and taſt of waters, as our Authour wiſheth them to do, *eadem*, *page* 85. but alſo and much more (as a thing of a much greater and more particular concerncernment to them) of the wonderful and vaſt difference of waters (in which none of thoſe thrée qualities is notably to be diſcerned) for the ſeveral uſes of ordinary houſe-keeping of Husbandry, and of ſeveral Manufactures, *page* 86. *If we may believe* Glauber, *there is ſcarce any ſand without gold*; I am very ſure that whoſoever believeth him herein, as in many other things, will find himſelf very fouly deceived; *Ibidem*, *ſave what is taken out of their Ditches*. For the word *Ditches* no wayes proper here, ſhould be ſubſtituted Bogs, Fens, or Moors; *It is indifferent good fuel*, yea, many ſorts of them are moſt excellent

fuel. An *Engliſh*-man ſpeaking of turffe, ſhould not name *Holland* only, but *Scotland* and *Ireland*, in which two Countreys turffe is of very great and general uſe, *page* 87. *There is a ſtone in* Durham, *out of which they make ſalt.* I would we were told the manner hereof; *Ibidem, Lead is found in* Durham-wall: I would fain know what *Durham-wall* is, whether a Town or Countrey, and in what part of *England*, and why *Derbyſhire*, where thoſe famous Lead Mines are, is not at all named here: *page* 94. *Opium is always an ingredient*, this is too generally ſpoken, *page* 95. I am not well ſatisfied with what he ſayes of tranſplanting Elephants into *England*, and making them of common uſe there, for many reaſons; and I believe it would prove as hard a task to people in *England*, with any conſiderable ſtore of Black Foxes, Musk-Cats, and ſome other of thoſe Animals named, *page* 96. in theſe words.

Paris, the ſecond of December, 1651.

THe conceit I find in your Legacy, *page* 99. *Of the medicinal vertues of the plants being ſublimed into the Inſects bredent of them*, is altogether deſtitute of truth, as very eaſily and practically may be demonſtrated, *page* 101. *That in* Ireland *rottenneſſe of ſheep is not known*; It is too well known there, and even in my time, I have ſeen great mortalities of ſheep cauſed thereby. *Page* 103. *In* Holland *they keep their Cattel houſed Winter and ſummer*: I never knew any Cattle houſed in Summer in my Countrey, but all about *Paris* that is very ordinary: *Ibidem, they bury the grains in the ground*; they keep them indeed in the ground; but in that manner as cannot well be called burying; for they dig holes a mans length deep and ſquare, cemented not onely in the bottom, but on all the four ſides, with a wooden ſhut at the top, and there they keep their Grains, not lying looſly; but rammed as cloſe as may be; *Rapeſeed-Cakes, Ibidem*, he ſhould have added *Linſeed-Cakes*: *Ibidem, Turnips*; I never knew them given to Cows in *Holland*, but at *Roven*, it is an uſual thing to feed Cows therewith, and they do thrive wonderfully therewith, as I am told by

by an *Engliſh* Lady of my acquaintance, an excellent Houſe-wife, who hath lived a great while in that City, *eadem pagina*, 103. *which are conſtantly mowed twice or thrice yearly*. I never in *Holland* ſaw or heard of any Meadows mowen more then once a year: The Paradox held forth. *Initio paginæ*, 104. *of the cleanlineſſe of Hogs, and their not loving Dirt*: I believe not at all to be conſonant to truth; eſpecially in the ſecond particular. *Ibidem*, *(the Jews have a peculiar way)* after thoſe words, I could wiſh to be inſerted; *(*which alſo anciently was moſt common among the *Romans)* For the liver of the Gooſe augmented to an exceſſive bigneſſe by a peculiar kind of cramming, was one of the greateſt dainties of the *Romans*, as may be ſeen in *Pliny*, *lib.* 10. *cap.* 22. and the Authours there alleadged by the *Scholiaſt*.

Paris, *the* 16 *of* December, 1651.

INſtead of going on for to make an end of my Annotations upon your Legacy, to the end whereof I am well near come; I ſhall at this time ſtep back for to tell you that one of *Purchas his Pilgrims* having given us moſt amply and diſtinctly the whole manner of making the *Caveare*, as may be ſeen in his *ſecond Tome*, *page* 1420. your friend will do well to leave that out of the Catalogue of thoſe things, which *page* 81. he deſireth to be informed of, by the travels of any Merchant or Gentleman: as likewiſe give you at large a Relation made to me within theſe few dayes by a brave *Engliſh* Lady, and an excellent Houſe-wife, greatly confirming and illuſtrating the practiſe of feeding Cows with Turnips; of which *page* 103. ſhe telleth me, that at *Roven* (where ſhe hath lived a good while) and in all the Countrey round about it, they feed their Cattel uſually in this manner. Of Turnips *(*not of the beſt, but refuſe ones, ſuch as being worm-eaten, or otherwiſe faulty, are not good for mans meat) they boyl a great many in a great Kettle, whole as they are, with their leaves on their tops; till they be tender, adding thereto good ſtore of bran; *(*of Wheat only, becauſe that, that of Rye, is ſcowring, and ſo not proper for

for them) and afterwards of the Cakes of Rape-seed, or Linseed; which cakes having a singular faculty of fatting Cattel, they put much lesse of them into the *Mesh* for Mich-Cowes, (for fear of spoiling their Milk) then for other kind: of this they give them twice a day, so as it maketh the greatest part of their feeding, much more then the hay, which they give them betwixt whiles: and thus they feed them onely in Winter-time, because that all the Summer long they keep them abroad at Grasse: Whether this be used in *Holland*, as your friend saith, I cannot tell of my own knowledge; having never there seen it, nor heard of it: but in *France* it is of very old standing, as appeareth by these words of *Columella, lib.2. cap.10. Rapa non homines solum, verum etiam boves pascunt, præcipuè in Gallia, ubi Hyberna cibaria prædictis pecudibus, id olus præbet. De-serres* doth also speak of it, but very shortly, and onely mentioning it in a word or two. *lib.4. cap.9.*

Paris, the 6. of January, 1652.

IN the 104th. *page* of your Legacy, where I left with my last Annotations, I find these words: *In Barkshire many keep tame Pheasants, and have gained well thereby:* The which having communicated to a brave *English* Lady here, a great friend of mine, who hath been a great House-keeper in *England*, and is a most excellent House-wife; she tells me that at a Countrey-house of hers, not far from *Chelsey*, she had always great store of them; insomuch as she hath hatched to the number of 200 in one Spring: whereof though many died, yet far and far the greatest part would come to perfection. That of people of quality, she never knew any but here self who kept any; but that there is abundance in the parts near *London*, who keep them for to make profit of them, and sell them to the Poulterers, that there is nothing more easie to bring up, and to keep, then Pheasants; when they are once past the first Month: for till then, they must be kept onely with Aunts eggs, and feed on nothing else; of which one would think it a hard matter to get so many, but there are fellows in *England*, who for a little

little money will get one as many as one can deſire: the firſt month being paſt, they are kept afterwards with Oats onely, requiring nothing elſe: but as they love to be kept in Graſſie fields: ſo one muſt change them ſomwhat oft to freſh grounds, becauſe they taint the graſſe and the ground in the ſame manner, as Geeſe do, and for to keep them in, my Lady uſed to have ſome parcels of ground, where they were kept incloſed with lats.

Paris the 13. *of* January 1652.

YOu ſhall have now the Concluſion of my Annotations upon your Legacy according to your deſire.

In the bottom of *page* 104. your friend ſpeaketh, as if the excellency of Butter and Cheeſe depended onely on the handling of it, and that Cheeſe like to *Parmeſan* and *Holland* Cheeſe, might be made in *England*, if the ſame induſtry were uſed there, as in thoſe Countreys which is nothing ſo: For though Art and Induſtry can do very much in this particular, as in moſt others, whereof I have ſeen moſt remarkable examples both in *England* and *Ireland*, yet there is ſomething in the particular nature of different waters and different Soils, and of the food for Cattel thereon growing: and conſequently in that Cattels milk, and in the Butter and Cheeſe made thereof, which no Art nor humane skill can ſupply or imitate, no more then the ſame kind of Beer can be brewed in all places, or the ſame kind of Wine be made to grow on all grounds. And this is moſt manifeſt hereby, that in *Holland* it ſelfe there are made ſeveral ſorts of Cheeſes hugely different among themſelves; which difference is moſt remarkable in thoſe two excellent ſorts, (*viz.*) the *Edam*-Cheeſe (being that kind which is ſo much tranſported into forraign Countrys, & every where known by the general Name of *Holland*-Cheeſe) & the *Stolk*-cheeſe. And if it ſhould be thought, that that diverſity proceedeth frō the different makings of cheeſe, uſed in the ſeveral parts of that country; I can aſſure you, that if you make *Edam* & *Stolk* Boors exchange their habitations, and keep all their own faſhions, each of them ſhall make Cheeſes, not ſuch as they were wont to make

at home, but as used to be made in the places to which they are come. The like may be said of the green cheeses, made in *Holland* Sheeps milk, especially those of *Graveſand*, *Toſſel*, and *Grind*; all three most excellent ones; and yet extreamly differing among themselves. And not to go for examples of this, further then *England* it self; It were against all reason and experience to think that, that notable difference betwixt *Suffolke* and *Cheſhire*-Cheeses, commeth onely from the different way of making it. Another thing which I find fault withall in the same Discourse, is, that the Authour nameth the *French Argolets* among the excellent sorts of Cheese; whereas they are nothing so, neither in their qualities, nor in their price, they being sold for two *Sols* a piece, whereas they use to weigh half a pound. I do likewise mislike, that he for to instance in the best kinds of Cheese; he fetcheth *Parmeſans* and *Holland*-Cheeses from abroad, without taking notice; that at home in several parts of the Land, and particularly in *Mountgomeryſhire*, Cheese is made equal to the best of these kinds; and at *Chedder* in *Wiltſhire*, that which in my judgement is far to be preferred before them, and to any other Cheese in the world. *Page* 105. I cannot brook that he complaineth *England* hath but a *Syſtema*, or a compleat Book of all the parts of *Agriculture*; and reckoneth *Markham* among them, who have writ onely divers small Treatises of it: whereas *Markham* hath comprehended in his works whatever belongeth to any part of Husbandry, and Housewifery too; with very few and small omissions; such as in no wise can rob him of the name of a general writers; his works also having that excellency, that they are altogether squared for *England*, and go on experience, rather then on probabilities, and hear-says; to the contrary of what our Authour seemed to tax in him, as well as in other writers of that kind; which maketh me suspect, that either he hath not at all been conversant in *Markham's* writings; or that in reading of him he hath been strangely forejudged, he being in my opinion, one of the most excellent of his kind; and in many particulars to be preferred before the most excellent of them all. It is true what is said *page* 106.

There

There were among the Ancient Romans some appointed to see that men did tell their Land as they should; but that which follows: *And if they did not, to punish them as Enemies to the Publique*; is too hyperbolically spoken, there being a vast difference betwixt punishing one as an enemy to the Publique, and a simple fining of him, which was all the punishment inflicted for that fault, as you may see in the twelfth Chapter of *Aulus Gellius* his fourth Book. In these words, *page* 107. *He that turneth fruitful lands into barrennesse, as the Land of Canaan, very fruitful heretofore, but now a barren Desart.* Our Authour says nothing, but what is common in the mouth and pens almost of every body, and yet the truth thereof is very questionable, as an observant Reader will easily find by the exactest and latest writers of that Countrey, among whom *Eng. Royer* is to be placed in the very first rank. By the way of addition to what heretofore I have told you upon that passage of your Legacy, which speaks of tame Pheasants, be pleased to take notice what I was told this week by an *English* Gentleman, *viz.* that many years since he hath known tame Pheasants kept in several parts of *Buckinghamshire*, especially in a Village a little beyond *Wickham*, where the people keep abundance; for to sell them off to the Poulterers of *London*. And at the same time an *English* Merchant told me, that above 25 years ago, he knew some kept at *Middleberg* in *Zealand*, and that Mr. *William Courtine*, the Brother of Sir *William Courtine*, had above a dozen pair of them. The same person also assured me from his own experience, that the Inhabitants of the Island. *Chius* keep huge numbers of tame Partridges, the which flying abroad most part of the day, do not fail to return every night each one to his own home, and likewise as oft as they are called by their Keepers, if they be any where within hearing of them. And he assured me, that they do this not onely in the places they are used to, but any where, insomuch that if any man carry his Partridges twenty or thirty miles from his dwelling, and then letting them out of the basket, in which he hath brought them, throw stones among them, expressly for to scatter them, so as all of them do run or fly several wayes, they

will all come to him, as ſoon as he calleth them, and let themſelves be taken up by him, the one after the other. And thus I make an end, having nothing to ſay to any thing contained in the following pages of your Legacy; the re-printing whereof with thoſe alterations and amendments I have hinted to you, I do moſt earneſtly wiſh for, it being indeed a moſt excellent piece; and from the beginning to the end fraught with moſt excellent obſervations and experiments.

An Anſwer to the Animadverſor on the Letter to Mr. Samuel Hartlib *of Husbandry.*

TO begin with the firſt, which is about *Blacklead*, and ſo to take them in order.

Firſt, I affirm, and truely that Blacklead is found in *Cumberland*, and not in any other place of *England*, yea not in *Europe* that I can hear of, though I have diligently enquired concerning it. To prove this, you may read Maſter *Cambden* in his deſcription of *Cumberland*, where he is much troubled to find what name the Ancients gave it, *viz. Pigritica*, and divers other names hardly underſtood.

And 2. I know that out of *England* it is exported to *Holland*, *Germany*, *France*, *Spain*, and other parts of *Europe*, and and ſold at a conſiderable rate *per tun*.

And 3. Little mention is there of this among the late writers, as *Agricola*, *Kent-man*, *Boot de Boot*, or *Cyſalpinus*, unleſſe it be what he calls *Creta nigra*, but becauſe the Animadverſor deſireth further knowledge of this material, I ſhall briefly relate what I know of it.

This Mine of Blacklead in *Cumberland* (as I am well informed) is in the hand of ſome few men, as Maſter *Bolton* and Maſter *Bret*, who live in *Cornhil* nigh the Exchange, and ſell Colours, who once in ſeven years dig as much as they think convenient to ſerve, not to glut the Market, and then cloſe the Mine up again: I ſuppoſe the *Dutch* Merchant, and conſequently the Animadverſor were miſtaken, either through the ſimilitude

ſimilitude it hath to ſome kind of Slate, which colours the hands blackiſh, as the black *Iriſh* Slate, uſed much for bruiſes, and of which kinds I have obſerved, alſo divers ſorts in *New-England*, as in *Prudence-Iſle*, and elſewhere, but the blackneſſe of the Slate hath not that glittering as the black-lead, or elſe from the Ambiguity of the word *Black-lead*, which is not onely taken for this material, (which whether it be to be referred to *Terra. Creta, Lapides, &c.* I will not here diſpute) but alſo for that ſort of Lead, over which the *Dutch* call glack or glittering (as the Black-lead) much uſed by the Potters for nealing (as the Animadverſor call it) or rather for leading their pots, which is abundantly found in ſome parts of *Wales*, and is fuſible in the Potters fire, which the other black-lead is not, neither doth it naturally contain any fuſible Mettal or Mineral, as I have proved: I think it likewiſe not amiſs to certifie that in *New-England* this Material is found in divers places; as at *Naſhaway* about forty miles from *Boſton*, as alſo on *Pequat* River about eighty miles from *Boſton*: this laſt was given from the Court of *Boſton* to a friend of yours and mine, *viz.* Mr. *John Winthrop*, this Gentleman ſent divers pieces thereof to me, that I might enquire of ſome *Dutch* Merchants what price it bare in *Holland*, and how much might be vendible, which accordingly I did, and alſo ſhewed it to the two Gentlemen above named, who were very inquiſitive where I had it, and how much might be procured thereof, and deſired that I would leave one of the greater pieces with them, that they might try it which I did; and the next morning enquiring again what they ſaid to my black lead; they told me it was nothing worth, becauſe it would not endure the Saw, they hoping, as I after found to have had enough for to have furniſhed *Europe* with black Combs, which are very rare and dear, a ſmall one uſually ſold at twenty or thirty ſhillings: My friend Mr. *W.* hoped that this material had been *Plumbago Ciſalpini*, which he alſo calleth *Mater Argenti*. But I ſuppoſe in this particular he was miſtaken. yet upon Examination we found pure ſilver amongſt it, which by calculation might amount to 15 *l.* *per* tun, though the black lead ſent me, was found onely on

the ſurface of the earth: I am the longer on this diſcourſe, becauſe this material hath been little conſidered as yet by learned men that I can find, and alſo becauſe my friend would be glad to have ſome ingenious men to joyn with him in a Work, which hath very great probabilities of very great profit to the undertakers.

The common uſes of black-lead, are firſt to make black-lead pens for *Mathematicians*, *&c.* 2. For Painters and Limners. 3. For thoſe that work in Copper to make their hammer go glib. And laſtly, if any great pieces be found, which is rare in *Cumberland* Mine, to make Combes of them, becauſe they diſcolour gray hairs, and make black hair of a Raven-like, or glittering blackneſſe, much deſired in *Italy*, *Spain*, *&c.* But I cannot believe that the Potters uſe it for nealing their pots (as the Animadverſor ſaith) becauſe it is altogether infuſible.

To the ſecond Letter of the Animadverſor.

FIrſt, I ſee the Animadverſor is offended, though I hope without juſt cauſe, that I quote *Glauber* and *Helmont*, as men of learning and credit. I know that learned Writers ſcorn to quote *Neotericks*, but I hope without offence I may, becauſe I only meddle with the plough, a rude and poor inſtrument, and Agriculture is commonly thought to require little learning or judgement, and being unlearned my ſelf will not follow the Cuſtomes of thoſe whom the World count profound and judicious.

2. The Authours above mentioned are in good repute with divers whom I ſuppoſe learned.

3. They have laboured and experimented much, as all men know, to find out the truth, and to advance the Commonwealth of learning: Some imperfections I impute to humane frailties, old age, &c. And I ſhould be glad to ſee a ſolid anſwer to *Helmont*, who hath thrown down both *Ariſtotles* Philoſophy, and *Galens* Phyſick; and as yet I have not ſeen any man who hath in any meaſure vindicated their old Maſters.

ſters. Further, I ſhould rejoyce to ſee an experimental Philoſopher confute *Glauber's* Experiments by experience; till this be done, I cannot but account them ingenious men, and well deſerving of the Commonwealth of Learning; and I cannot but account it robbery, or at leaſt great ingratitude, to take any thing out of a learned Authour, and not to acknowledge it, but to the particular Exceptions.

The Army diſeaſe (ſaith *Helmont*) came into *France*, as alſo ſmutting of Corn, 1530. And the firſt ſeemeth to have proceeded from the latter; alſo at this time the Pox raged, which might alſo have ſome augmentation from this corruption of Corn. Although it never was my intention to defend other mens paradoxes, yet I cannot but ſo far defend him, as to ſhew that what is here ſpoken, hath conſiderable probabilities for truth.

And firſt, That the Smuttineſs of Corn, and the Army diſeaſe came both together in *France*; I am much miſtaken, if the *French* Hiſtory do not report the ſame, and the Animadverſor ſeemeth to grant it. As for the Pox it broke forth violently at *Naples*, 1494. in the *French* Army, as *Helmont* and *Hiſtorians* affirm; and was even then in ſome meaſure diſperſed in *France*, but after this ſmuttineſs of Corn, it might exceedingly more abound. As the Plague in *London* oftentimes lurks in divers corners many years, but breaketh not forth violently uſually, but after ſcarcity; by the which the humors of the body are more corrupted by ill dyet: But be it this or no, I will not further diſpute; but will affirm thus much, that it is not an abſurd and fooliſh conjecture, to ſay that the Army diſeaſe might proceed from ſmuttineſs of Corn, they both invading *France* at the ſame time; but the moſt probable I have yet ſeen, eſpecially if that other part be added, *viz.* The bodyes corrupted with the pox; for I have oft ſeen in *Italy* an ordinary Feaver in ſuch bodyes to be at length not much unlike the fore-mentioned diſeaſe; (and this is that *Helmont* eſpecially drives at in his Book *de peſte*, where he mentioneth only the Pox by the by:) and who knows not that the corruptions of the aliments ſomtimes produce even the plague,

and

and I think that the corruption of the beſt aliments, as bread, and which are in moſt uſe with us, cauſeth the worſt Epidemical diſeaſes; to the which *Hippocrates* ſeemeth to allude, where he ſaith, *Corruptio panis peſſima*; and it is alſo too well known, that we who have within theſe few ſcore of years, altered very much our dyet and cuſtomes, as by bringing in of hops into our drink.

2. Uſing abundance of Sack, which in Queen *Elizabeths* dayes was ſold in the Apothecaries ſhops.

3. By uſing of Sugar, Currants, and other ſweet things abundantly.

4. By taking Tobacco in ſmoak.

5. By uſing Sea-coals abundantly in *London*, and through the Countrey.

6. By uſing frequently Dyet-drinks, Purgations, Vomits, Blood-letting, Iſſues, which were ſcarcely known to our forefathers.

7. I may adde the living altogether on fleſh, which in the times of Popery, we did not: I ſay have cauſed not onely great alterations in our wills and diſpoſitions, but alſo in reſpect of heath and ſickneſſe. Some ſickneſſe not being known now, which formerly did much annoy, as the ſweating ſickneſſe in *Hen.*7. and before, as alſo the leproſie which Mr. *Camden* thinks came from *Egypt*, where it abounds very much, Chriſtians getting ſomething for their holy voyaging; but Phyſicians ſay it came from eating of fiſh; for where moſt fiſh was eaten, there it moſt abounded; and eating of fiſh being left; that noyſome diſeaſe (God be thanked) is even totally unknown, and all Hoſpitals for them diſſolved: and on the contrary, many diſeaſes aſſaulting us, ſome totally unknown, as the Rickets; others not ſo much known, as the Stone, Gout, Conſumptions, Ptyſick, *Fluores Mulicbres*: and here I will briefly according to my Countrey-Philoſophy tell you how theſe new diſeaſes are cauſed: and firſt from the Hop, Sack, Spices, I ſuppoſe the Gravel, Stone, Gout; from Sugar and Currants, and ſweet things, which ſpoil the ſtomack, and make the body tender, ſoft, cuſtard-like, eaſily melted into fluxes,

proceed

proceed *Fluores Muliebres*, abortion, and a foundation for the Rickets, and other indiſpoſition in children, *ex parte matris*. From Tobacco (which is a kind of poyſon contrary to our natures, as it appears by the firſt taking, cauſing Vomits, Faintings, cold ſweats, though uſe afterwards mitigates theſe Symptonies, as the *Turks* by uſe take abundance of *Opium*, as much I may ſay, in one day, as will kill twenty *Engliſh* men: likewiſe it taketh away the appetite, not by real ſatiating, but by its Narcotickneſs deluding nature) ſince followes the abating of the ſtrength, and vigour of the body, the dulling and miniſhing of the Spirit, and conſequently the dulneſſe and paucity of ſpirits in children, which as the learned Phyſicians hold, is the ſpecial cauſe of the Rickets, *ex parte viri*: Sea-coal cauſeth conſumption, Ptyſicks, and the indiſpoſition of the lungs, not onely by the ſuffocating by abundance of ſmoak, but alſo by virulency: for all ſubterrany fewel hath a kind of virulent or arſenical ſmoak, which as it ſpeedily deſtroyes thoſe that dig in Mines, ſo doth it by little and little thoſe who uſe them here above: therefore theſe diſeaſes *moſt* afflict about *London*, where the iron Caſements, and all iron things are ſoon conſumed by the ſmoak thereof, and *leſſe* in pure clear air, where this fire is not uſed. The great and frequent uſe of purgations (which are ſmaller poyſons, for they extract the good humors as well as the bad, as moſt Phyſicians confeſſe) and Bloodletting do cauſe that infirm, weak, & feminine diſpoſition in many natures. And to theſe cauſes above-mentioned, adde Idleneſſe, Gluttony, Drunkenneſſe, not much known till Queen *Elizabeth*: for then the firſt Statute was made againſt Drunkenneſſe, the Peſt of Whoring, and the conſequences thereof, as general cauſes of all indiſpoſition above-ſaid, and of hundreds more, and to conclude of ſhortneſſe of life.

In *Fryer Bacon's* time, which was above 400 years ago, Countreymen lived ſtrong and luſty, even to ſeven ſcore, eight ſcore, as he reports in his Book *De Pet. Artis, & Naturæ*: Now how rare is an old man of an hundred years, not becauſe the World decays, as Maſter *Hakewell* learnedly ſhews, but we by reaſon of our folly, live not out half our dayes. But I

deſire pardon for this long digreſſion, it being onely to ſhew that the alteration of dyet cauſeth many diſeaſes, and the corruption thereof many Epidemical indiſpoſitions, and that to ſay Smuttineſſe of Corn produced the Army Diſeaſe, is not ſo abſurd as the Animadverſor would have it. As for the Pox, which *Helmont* doth but lightly touch, I will not long diſcourſe, whether it proceeded from eating mans fleſh at *Naples*, (as Lord *Bacon* and others ſeem to affirm) or from the *Indyes*, which is moſt likely; but how it firſt came amongſt them, is very difficult to know, its moſt probable from their baſe corrupt dyet, eating mans fleſh, not uſing ſalt, or any thing of high taſt, as I have obſerved amõgſt the *Indiã*s of *New England*, where i abounds, or perhaps from *Beſtialitys*: But I may before I am aware engage my ſelf in that hard Queſtion concerning Contagion, which I acknowledge is too hard for me, as alſo the cauſe of the extream multiplication of poyſons. He that can tell me how Ferments operate, or how water contracts a muſtineſs of wounderful extenſion, and like fire infinitely multiplyable; *Erit mihi Magnus Apollo.*

Animadverſor. Smutty Corn is a ſimilar diſtemper, and therefore not viſible by the Microſcope, &c.

IF by *Similar Diſtemper*, the Animadverſor mean, as I ſuppoſe he doth, total corruption, then he is miſtaken in the *Engliſh* word. For the total corruption of Wheat into Smuttineſſe, which being broken, flies into black duſt, we call *ſmutty bags*, and theſe have loſt their ſpecifique and vegetative vertue, ſo that they will not grow, as I have tried divers times: but what we may call *ſmutty wheat*, is only a partial corruption, and may partly be ſeen by the eye, the wheat being dark and black, eſpecially about the eye; its alſo ſpungy, ſoft, hollow, light: I ſay that perhaps the imperfection of this grain, whether it be external, as ſome eroſion Canker, or ſome more inward indiſpoſition may by the *Microſcope* be perceived, for by it (as I have ſeen) ſtrange inequalities, roughneſſe, and as it were veins diſſemmated throw the body of the ſeeds are plainly

plainly diſcerned, which the eye cannot: and further by experience I know, that the vegetative vertue of the ſeed lyeth in that part which we call the eyes. For I have cut divers grains in the middeſt, and ſown them, and that halfe which had the eye with it unhurt, grew as well as if it had been a whole Corn, the other part not; ſo that I had above two thouſand encreaſe for one half of a grain, and very excellent Corn, in ſome ears an hundred grains, in many ninety: This cauſeth me to queſtion that which I have oft heard amongſt Countrey men that Peaſe eaten by Magots will grow, but produce Magots: for if the eye be whole, the difference will be found nothing betwixt theſe and others.

Animadverſor. Corn ſown in Summer, viz. July, *will not come to good.*

NOt only my friends experience, but alſo mine own doth manifeſt the contrary: and I queſtion not, but his own experience, if he pleaſe to try, will ſhew the contrary. For Corn ſown in *July* will not run to an ear till the next year, though it be warm Land, and if it ſhould begin to ſpindle, (as the Husbandmen call it) it is very eaſie by mowing or feeding it down with Cattel to prevent it: and here *I* think it not amiſs to relate what *Alex. Guagnini* reports of *Poland* in this kind. They begin to ſow Rye the fifth of *Auguſt*, (which I ſuppoſe is twenty dayes before ours) and end about the latter end of the ſame month, or elſe they have no crop to ſpeak of, alſo there is a new way uſed in Lands newly burnt thus: With two parts of Barley they ſow one part of Rye; the Barley is reaped the ſame year, the Rye or Wheat groweth little till the Barley is off, then it will grow thick like graſſe all the winter, and next year it is reaped: it groweth ſo thick that an horſe can ſcarce get through it, out of one grain come thirty or forty ears a man on horſeback can ſcarce look over it, and the Farmer reapeth an hundred for one: by this you may ſee that what I ſay is not onely true, but alſo much practiſed, and that with incredible profit, and to me the reaſons are manifeſt:

feſt: for the advantages of early ſowing are theſe.

Firſt, The leſſer quantity of Seed is neceſſary.

Secondly, The Corn is well grown, and ſtrong before the Winter, and therefore more able to endure the nipping froſts, which oft killeth Corn newly come up.

Thirdly, It getteth advantage in the Spring of weeds, graſs, wild oats, &c. which choak much Corn, the ground being ſtocked with Corn ſo that there is no room for them to grow. I know one who having his ground over-run with weeds and wild-oats, by ſowing Rye early, had very good and clear corn. But ſome will object, that the ſtrength of the Corn and Ground is exhauſted thereby.

To theſe I anſwer, Firſt, They do not conſider the even infinite power of living creatures, who will infinitely increaſe, if nouriſhment fail not, as fire will, if wood be laid to it, and that without weariſomneſſe, by vertue (as I ſuppoſe) of the divine Benediction in them.

2. They are ignorant of the Cauſes of fertility; for I ſuppoſe that ſtraw or blade exhauſteth ground no more then the boughes and leaves of Trees do, which we ſee is little or nothing in wood continually lopt: but to know the true cauſe of fertility, I account difficult, yet ſhall briefly declare ſome thoughts of mine concerning it in another place.

Animadverſor. His Philoſophy concerning Moor-logs no wayes receivable.

IN Mooriſh places two ſorts of wood are found, One very black like Ebony, and it is a kind of Oak: Another ſort leſſe black or dusky, and is a kind of Pine or Fir. In the *North* of *England I* have ſeen it ſold publickly, being ſlit in ſmall pieces to light Tobacco: it's not unlike the wood which in *New England* is called Candle-wood or Pitch-pine. Concerning the blackneſſe of theſe woods *I* ſay, that it proceedeth from the turfy earth, wherein theſe Trees lye; which earths, and all other earths (as *I* ſuppoſe) and ſubterrany things in their proper places hath an innate power to tranſmute other extraneous

ous things into their own nature: many examples of this kind we ſee in nature: to inſtance onely in putrifying ſpirits or juces which tranſmute not onely wood, but alſo ſhels, bones, mettals, into their ſtrong nature without deſtroying the external form: ſo (*I* ſay) this earth endeavoureth to alter or change theſe Trees into it's turfy nature; and I ſuppoſe it hath already changed, as *I* ſuppoſe, the ſmaller boughs into it's nature, and introduced ſome indiſpoſitions into the greater wood: for this earth hath a peculiar and more manifeſt faculty of multiplying, then other earths have: for when it is exhauſted it groweth again, as I have heard of divers worthy of credit, if ſo be the water be kept on it all winter, and permitted to run forth in the Spring, which good Husbandry I have ſeen practiſed in divers places; and further every one obſerveth, that it preſently ſtops the Channels and Ditches which are cut through this kind of earth: and therefore from the Vapours, Fumes, or *Effluvia*, call them what you will; for *I* think all multiplicative Acts to proceed from ſuch ſpiritual things, and not from bodies; and of this earth, doth this alteration or blackneſſe of the wood proceed, as in putrification is ſeen, and not as in putrifaction: for the wood is ſtrong, firm, and oft uſed for boards and building: as to explain my ſelf, Smoak will diſcolour any thing that is long hung up in it, but in this there is a vital, active, multiplicative Energy, which worketh not by putrifaction, which in ſmoak is wanting: that the Pine is not ſo ſoon changed as the Oak, it is becauſe it is of a more reſinous or oyl nature, Pitch, Roſin, and Turpentine, being made out of ſuch Trees, and therefore it is not ſo eaſily penetrated: This is in briefe my Philoſophy concerning *Moorlog*, if I am in an errour, *I* will thank him that ſhall ſhew me the truth.

Animadverſer. Too credulous to Glauber, *who will make Beer without malting, &c. Aqua-vitæ, &c. out of Haws, Cankerberries, &c.*

TO which I anſwer, That Beer may be made of Wheat, Barley, Peaſe, &c. unmalted, I queſtion not; for it is

ordinay to adde Wheat ground, or Beans with Malt to make the Beer ſtronger, and with good ſucceſſe. Alſo *Cromer* in his Deſcription of *Poland* ſaith, that they oft make Beer of Wheat ground, &c. yea *I* know that Potatoes maketh excellent drink in *Barbadoes*; alſo in *New-England* the ſtalks of *Virginian* wheat, as it is uſually called. Squaſhes or Gourds, Pumpions boyled make conſiderable drink; Parſnips make that which is accounted rare; therefore much more the Grains above mentioned: But the great queſtion is, Whether Wheat, Barley, &c. malted or unmalted will make moſt and beſt Beer, or *Aqua-vitæ*. *Glauber* affirms he knows how to make more of Corn unmalted then malted, which though *I* will not poſitively maintain; yet *I* ſuppoſe that *I* can make it appear, that it is not onely poſſible, but probable it is ſo by divers Arguments, beſides *Glaubers* teſtimony: for,

First, An ingenious Chymiſt of my acquaintance, altogether unacquainted with *Glauber* and his writings, hath affirmed to me, that he hath oft experimented it, and hath proffered wagers even to Brewers concerning this. Alſo *De la Broſſe* Phyſician to the King of *France*, and Keeper of the Royal Garden at *Paris*, affirmeth, that out of twenty of Wheat fermented his way, he can draw forth no leſſe then three pints, and a Chopin of excellent *Aqua-vitæ*, which is above three *Engliſh* pottles; more by far then any will undertake to draw out of the like quantity of Wheat maulted: and further it is without queſtion, that ſome of the vertue of the Barley is drawn away by ſteeping in water, for oft the water at the bottom is very red: and alſo by the ſprouting, for that uſually is dryed up, and goes away into duſt, onely uſed for the enriching of Corn Lands, and further the difference between the weight of Barley and Mault is very conſiderable, Mault being lighter then Barley, as *I* have tryed by a fourth part, or thereabout, which is certainly a diminution of the flower or ſtrength, for the husk is the ſame in both. Further, what good this fermenting or maulting doth further then to ſoften the Grain, and make it ſpungy, ſo that the liquor may more eaſily penetrate, and liquefie the flower or nutritive part thereof into a ſweet juice,

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juice, which juice after by fermentation or working do th more ſeperate it ſelfe from the groſſer parts, and ſo at length pleaſant drinks, and *Aqua-vitæ* is made thereof, which things I ſuppoſe may as well, if not better be accompliſhed by other wayes of fermentation, and all the vertue of the Grain preſerved: But enough of this Paradox.

2. I ſuppoſe that all who have the leaſt skill in diſtillations know, that if any liquour will ferment, it will produce an *Aqua-vitæ*, yea and that Spirits or *Aqua-vites* may be drawn in ſome meaſure even out of Roſes, Violets, Cold Plants; why then is it ſo obſerved to ſay that *Aqua-vitæ* may be drawn from Haws and Hips, &c. For though they are fruits of unpleaſant taſts, yet we know that even the rougheſt and harſheſt Pears will make Perry not inferiour to the beſt, and in *Normandy* ſuch a kind of Pear is in greateſt uſe: and further (though I will not affirm, that the *Aqua-vitæ* of any thing may be made as good as that of Wine, &c. as a late *French* Writer doth) yet I ſay that ingenuity will advance much in this kind, and cannot but once again exhort men to try what may be had out of ſuch common and trivial things as Haws, Hips, Black-berries, &c.

Animadverſor. Fond opinion of Aſtrologers.

FIrſt, I name none in particular. 2. The worſt word I uſe is *fond*, which is not alwayes taken in the worſt ſence, and then at worſt it is but a diminution of folly, and may onely be applyed to that particular wherein they erre, but becauſe it offendeth, I deſire that hereafter it may be expunged, as alſo [*degrees*] to be changed into a thouſand miles.

Howe, is an inſtrument well known about *London*, and in all Plantations, with which they cut off weeds. I ſuppoſe it comes from the *French* word *Hoyau*, which inſtrument is uſed about their Vines.

Wheat is ſaid to *lodge* when through rankneſſe it falleth, and lyeth on the ground. *Hips* are not Haws, but rather what grows on *Eglantine*, *Roſa Canina*, *Piles* are pieces of Timber driven

driven into the ground to break the violence of the Seas and Rivers.

Glaſſenbury thorne is called of *Parkinſon*, *Spina acuta biflora Britanica*, becauſe it uſually blaſſometh at *Chriſtmas*, (as alſo a *Walnut-tree* in *New-Forreſt* in *Wiltſhire*) and after in *May*, as other thorns. Simple people call it *Joſeph of Arimathea's* ſtaffe, and repute it among the wonders of *England*, but it's found growing elſewhere.

To the third Letter of Animadverſions concerning Cyder.

I ſay in my former diſcourſe; and truly, that there are two wayes of making Cyder.

Firſt, After the juice of the fruit is expreſſed, preſently to put it into Barrels, and there to let it work as Beer uſually doth, and that there is not any neceſſity to put it firſt into Caves or great Tubs to work in, and thus I have oft ſeen it made in *Kent*, and very good.

The ſecond way, which I eſpecially commend, is to boyle the juice ſometime over the fire gently either by it ſelf alone, or with ſome good ſpices, and then to make it work with ſome barm or yeſt, as Beer doth, and afterwards to barrel it, and bottle it up; and this truly I conceive to be the beſt way for many reaſons; and I ſuppoſe the Weſt-Countrey Gentleman, whom the Animadverſor quoteth, conſenteth to this way; for he acknowledgeth that by boyling it may be kept longer, and that it is fitter for long Sea-voyages, and conſequently better; for boyling purifieth, diſgeſteth, and taketh away windineſſe, and crudities, as we daily ſee in boyling of Beer, and Ale eſpecially if it be with ſpices: Now this boyling ought to be before the working or fermenting; for then the watry part flyeth away firſt, and there is not any conſiderable decay of the Spirits: but if Cyder be boyled after it hath wrought (as we call it) then the Spirit, *Aqua-vitæ*, or life of the liquour firſt flyes away, as it is well known even to all *Aquavitæ* Diſtillers, and nothing remaineth but a dead, flat, unpleaſant liquour, nauſeous

nauſeous to the ſtomack, and alſo narcotick and very in-ebriating, as I have found by experience: for on a time diſtilling a ſtrong red wine, called *Tent*, that I might have a fine ſpirit for a peculiar uſe; I received what remained in glaſs bottles well ſtopt for ſome other occaſions. But a ſervant-maid of my brothers, ſuppoſing it had been that good wine ſhe ſaw me bring into my Chamber, was ſo bold as to drink two or three ſpoonfuls, which cauſed her to be extreamly ſottiſhly drunk: her Miſtreſs ſeeing her in that caſe, examined her what ſhe ailed, ſhe truely told her, that ſhe had onely taſted a little (and truely it was but a little) of that wine I had in my Chamber; her Miſtreſs preſently came to me with open mouth, fearing her maid had been poyſoned; but when I had told them the whole truth, the fear was turned into laughter and amazement; and then I remembred what formerly I had read in *De la Broſſe*, his Hiſtory naturall, concerning the in-ebriating vertue of the ſlegm of wime, which Doctor *French* likewiſe hath publiſhed in *Engliſh* in his Book of Chymiſtry.

To the fourth Letter of the Animadverſor.

FIrſt, I anſwer, that I am not miſtaken; for I certainly know, that we have Quinces from *Flaunders*, Cheſtnuts from *Portugal*, Walnuts from *France* in conſiderable quantities. I deny not but that they may alſo come from other parts; but if Walnuts come from *Holland*, as the Animadverſor ſaith, I am ſure that they grow not there, &c. Further I affirm, and truely, that ſmall nuts are oft brought out of *Spain* in abundance, and it is well known to all, which nut is very ſmall, but it hath a very thin ſhel, and a fine taſte like a filbert: *I* grant alſo that ſome years *Ireland* in the woody parts thereof hath plenty of ſmall nuts, but theſe nuts have thicker ſhels, and have not that ſweet taſte that the *Spaniſh* have, yet in *Ulſter*, where woods do abound, I never knew them cheaper then in *Kent*. Neither can *Ireland* ſupply the World, nay, not *England* with theſe nuts; for the greater part thereof is extreamly deſtitute of woods.

Concerning brewing without multing Corn, I have already ſpoken, and I hope ſhown probabilities, that it is not onely feaſible, but alſo to be done with profit.

Animadverſor. Graſting, Inoculating, &c. cannot be learned in two hours.

I anſwer, That the Rules for grafting and inoculating are ſo eaſie, the inſtruments ſo few and common, that I ſuppoſe a leſs time may ſuffice; and I know divers who can both graft, and inoculate excellently, and yet have obtained this Art, only by beholding a Gardiner grafting and inoculating, & that but a little while: but I confeſs that to be excellent in this Art, as in all other handy-crafts, there is required a convenient time, continual uſe, and a promp and ready hand, which every man hath not.

Animadverſor. Vines flouriſh not many hundred miles North of Alſatia, in France, Lorayn, Germany.

Anſwer, That it is ſo in *Germany*, (when Vines flouriſh not onely in *Sileſia* and the *Palatinate*, but alſo in *Brandenburg*, and alſo in *Pruſſia*, as *Cromer* reports) will plainly appear, as alſo in *France*, where Vines grow very far North in *Picardy*, and *Champeigne*: ſo likewiſe in *Lorayn*, and in thoſe places betwixt *France* and *Germany*, (not to ſpeak of the excellent wine in *Arbois* in the free County) Vines flouriſh even in *Liegh*, alſo about *Lovayn*, which are very far North many hundred miles from *Alſatia*.

Animadverſor. Vines grow not ſixty miles North of Paris.

Anſwer, That by the way of *Beaumont* and *Beauvois*, I have ſeen them flouriſh nigh twenty leagues from *Paris*, and that they may flouriſh more North, divers think, and blame either the negligence or ignorance of the Inhabitants. Moreover by the way of *Pontois*, through *Normandy*, Vines do flouriſh even ſo far North as *Arles*, 35 leagues from *Paris*, and within five leagues of *Dieppe*; and I think if the Soil of *Normandy* were warm land, they might flouriſh further North, but *Normandy* is a ſtiff, chalky land, very improper. *Rhemes* alſo is above twenty leagues, *N. E.* of *Paris* hath abundance

bundance of vines and is accounted the ſtaple of wines in thoſe parts: Therefore it will plainly appear vines to flouriſh ſixty miles North of *Paris*, and conſequently little from the latitude of ſome parts of *England*, *viz.* the South-Weſt part of *England*; and therefore I cannot but again deſire ingenious Gentlemen to endeavour the planting of vines with us, eſpecially thoſe four ſorts I have formerly mentioned, (according to that way that Captain *Tuck* an ingenious Gentleman of great *Chart* in *Kent* doth) and that Vines will proſper, is not only probable for the reaſons aforeſaid, but alſo becauſe the vines flouriſh alſo naturally in *Canada* a very cold place, and alſo Mr. *Cambden* reporteth that many hundred years ſince, that vines did very much flouriſh in *Brittain*, and of latter years at *Ely* in *Cambridgſhire*, at *Ley* in *Eſſex*, as it appears in *Dooms* Book were ſix Arpens of Vines, and it yeilded twenty Modes of wine; alſo he accuſeth us of negligence and ſloth, that there are not Vineyards in *England* at preſent; Alſo *William* of *Malmſbury*, who lived before *William* the Conquerour, ſpeaketh of the Wine of *England*, and ſaith it is little inferiour to the *French*, not having ſuch an unpleaſant tartneſs, but not long after *William*, and his Sons reign, *Gaſcony* fell to the *Engliſh*, and ſo remained three hundred years, which might be the true cauſe of the ruine of vineyards. Yet at this day I know divers Gentlemen in *Kent*, who make ſome Hogſheads of good wine moſt years, and every year plant more. I hope this buſineſs will be proſecuted more generally through this Land, ſeeing it will conduce very much to the profit, pleaſure, and honour of this fortunate Iſle.

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Animadverſor. Pack in ſo many Plants about Paris, &c.

I mean not of different Species, but of the Plants of vines, as may well appear by the following words; *viz.* That they may have greater encreaſe, &c. And I queſtion not, but that the Animadverſor hath obſerved the ſame fault; for the vineyards about *Paris* have uſually twice the number of vine-plants on their ground as are neceſſary; and further it is certain, that if the Vines were thinner, the Wine

would be better, becauſe the Vines do ſhade one another.

Animadverſor. To ſhort Poles as we do Hops, &c.

It is well known that we tye not Hops to ſhort poles, but to long ones; and therefore I compare the Vine and Hop together in this reſpect only, that both want poles to uphold them; but becauſe that the ſenſe is not clear to all, in the next Impreſſion a word or two ſhould be added: *viz. Hops to long ones.*

Animadverſor. Preſſing with the feet not frown in the Northern parts of France, &c.

I lived in *Charanton* two leagus from *Paris*, a whole Vintage, purpoſely to ſee how wine was made in *France*, and never ſaw any other way uſed there; only the husks at the concluſion uſe to be brought to the great Preſſe, out of which they expreſſe ſome ſmall quantity of wine, and therewith uſually fill their Hogſheads, which uſually waſte in the working: and further in *Italy*, I never ſaw any other way uſed. Moreover, to tread out wine with the feet, is, as I ſuppoſe, an old cuſtome, and no diſparagement to the wine; for we know that moſt of the Bakers bread in *England* is kneaded with the feet, and yet none are offended at it: Neither did I ever ſee it work in Caves or great Veſſels (unleſſe for 24 hours) as is ordinarily in *Lombardy*, in *Italy*, by eight, ten, or twelve dayes, but preſently in *France* they put it into Hogſheads, and there let it work, keeping them alwayes full, that the ſcum of froath may go forth. Neither do I ſee any conſiderable inconvenience by doing thus, onely a greater quantity of groſſe lees will be at the bottom of the wine; but if wine ſhall any time work in great tubs with the husks of the Grapes, it will loſe its colour, grow *Garbo*, or rough, flattiſh, &c.

Animadverſor. That would deſtroy.] *A bitter Word againſt my Countrey-men, &c.*

I particularize no Nation, and we have the aforeſaid Commodities from divers Countreys. *viz. Poland, France, Germany,*

many, *Holland*, *Flanders*. I am ſorry that the Animadverſor did ſo unhappily apply it to his own Country, and that againſt my will I am a true Prophet. But whatſoever is bitter I diſallow, and wiſh it expunged; for I proteſt againſt it, and really did wonder to ſee it in my diſcourſe, hating tartneſſe in writings. I hope my pen ſhall ſlip ſo no more, yet I ſhould be glad if the State would ſeriouſly conſider what extream inconveniencies may fall on this Nation through want of Hemp and Flax, and how eaſie it is to have ſufficient for our ſelves, as I have ſhewed in my former diſcourſe.

Animadverſor. Nothing more hurtful to fruitfulneſs, then common ſalt, &c. Niter the only fruitlifying ſalt, &c.

Though I conſent with the Animadverſor, that to ſpeak plainly, ſo as the Countrey-man may underſtand me; I ſay that *Niter* is the ſpecal cauſe of fruitfulneſs, yet I cannot deny Salt to be the greateſt enemy to it. For firſt about *Nantwich*, where much ſalt is made by boyling ſalt-water, the refuſe ſalt doth very much improve their Meadows; and *Paliſſy* a *French* Author doth likewiſe affirm, that ſalt doth cauſe divers places about *Rochel* to be very fruitful; alſo Sea-ſand, as I ſuppoſe, hath its fruitfulneſſe from the ſalt in it: Likewiſe the ſalt of aſhes, &c. ſeemeth to me to have as much, if not more affinity to common ſalt as to *Niter*, as appears by its Cubick form; yet they do much fertilize both Corn and Paſture: Further, the Lord *Bacon*, whoſe authority is of good credit with us, attributeth fertility to ſalt. As alſo *Markham*, whom the Animadverſor approveth of as an experienced Husbandman, who preſcribeth common ſalt alwayes to be mixed with his Grain for the obtaining of incredible Crops. Indeed, I grant, that if too great a quantity be uſed through the corroſiveneſſe thereof, it cauſeth barrenneſs; but the like we may ſay of Lime, Soot, Aſhes, &c. yea of *Niter* it ſelf; for I know by experience, that under great Pigeon-houſes, Walnut-trees, as Vines, Peaches, &c. will not proſper; and I know no other cauſe then this, That too great a quantity of Pigeons

dung doth fall down from the Roofe of the houſe, and ſo the Trees are deſtroyed.

Animadverſor. They in Holland preſerve their Dung and Urine, no otherwiſe then elſe-where, &c.

They are far more careful then we are in *England*: ſo that the Sun may not exhauſt the vertue, nor the rain waſh away the ſtrength thereof, which I note as a good kind of Husbandry, both to be commended and imitated.

Animadverſor. Italy ſendeth forth little paper, as alſo Holland, &c.

The fineſt paper we have in *England*, comes from *Genoa* and *Venice*, yet not ſo much from the latter place as formerly, ſince the plague there 1630. Much of this paper is gilded with Gold on the edges. *Holland* ſhips not onely furniſh us with a thick ſtrong white paper, which is commonly called *Dutch* paper, but alſo abundantly with a ſtrong brown paper much deſired by the Grocers. (Although at preſent, leſſe is imported becauſe we have many Paper-mils lately erected) but whither this be made in *Holland*, *Frieſland*, in *Germany*, or elſe-where, I diſpute not.

The fifth Letter of the Animadverſor.

The Abel Tree is a Popular, not a Salix.

I Thank the *Animadverſor* for reforming my errour; for I was informed that it was a kind of *Sallow*, but it ſeemeth it is a kind of *Popular* or *Aſpe*; and ſo at length by enquiry I have found it named by *Parkinſon* in his Herbal.

Animadverſor. The profit of Silk is not ſo great as of Corn and Wine to France.

I do not poſitively affirm it, but onely report it upon the credit of a late *French* Writer, whoſe name I at preſent remember

member not, and I am alſo far from my Library, that I cannot turn to him: It indeed ſeemeth to me likewiſe very probable, for I know that Corn and Wiue are heavy, bulky commodities, of low rate, Wine ſometimes being not much more worth then the Barrel, and Corn ſcarce a Merchandable commodity in any place, yea *France* it ſelfe ſometimes wants it: ſo that a little Silk will ballance theſe two, and *France* as it is well known hath not onely ſufficient for it ſelfe, but many Pluſhes, Velvets, and other Manufactures of Silk, were in a conſiderable quantity exported for *England* till the late prohibition; and why may not Silk do that in *France*, it doth in *Italy*. Yea that which all will grant Flax doth for Linnen, Canvaſes, &c. and are of greater value.

Animadverſor. Silk is a ſtranger to the parts that are nigh Englands Temper.

King *James*, and his learned Councel in their Letter to the Deputy Lieutenants affirm the contrary, and bring this as an Argument to encourage the people to ſet upon this work.

Secondly, Much Silk is made at *Tours*, (yea I am informed that that populous Town doth even totally ſubſiſt by it) which place is not very much different from *Englands* temper, being not much above two degrees from the South of *England*: and I ſay again, if Silk-worms are come even out of *Perſia*, *China*, and thoſe very hot Countreys, as far as the heart of *France*, which is very temperate and yet theſe Worms thrive very well there; why may they not come a little farther, and why do we not ſtrive to advance them here as well as *France*? yea we find by experience, that ſome few Gentlewomen have bred divers up for their pleaſure, even as far North as *Duckenfield* in *Cheſhire*, where ſome quantity of Silk hath been made, yet this place is nigh as farNorth of ſome places of *England*. As they of *Tours*. Moreover, a Lady (*Virginia F.*) as I have lately ſeen in print, hath hatched worms in *England*, and then turned them forth to the *Mulberry-trees*, expoſed to the cold and moyſture of the Air, and yet they have done well, yea better

better then those within doors. These and other reasons do so far convince me, that I cannot but again and again desire ingenious men to proceed in this rich and pleasant work.

Animadverser. Moysture is no way nourishing to these Worms,

First, I say in general, that heat and moisture are the two great Causes of Insects; where these abound, Insects abound, where one of these are wanting there are but few engendered, And why should we exempt these from the common generation of Insects? and consequently if ingendered by these, nourished by these according to the old Axiome, *Ex iis nutrimur, ex quibus constamus.*

And 2. We know that the damp, moist Woods of *Virginia* do breed Silk-worms of an incredible bigness, surpassing the *Spanish* and *Italian*. And likewise that a Lady in *England* (as I have it from a friend whom I dare believe) turning the Silk-worms not long after they were hatched into the *Mulberry trees*, by experience found, that they prospered better then those that were kept dry within dore: yea in *Ireland* in the County of *Cavan* in *Ulster* [the moistest of all places] a Gentleman kept divers Silk-worms, which prospered very well, and therefore I cannot think moisture, as moisture, any considerable enemy to them; for of it self it hath little activity, and if these worms shall not thrive in any place, I will rather attribute it to cold which is known to be an active quality, and the great destroyer of all Insects; for we see in *England* that moist Summers do increase Flies, Gnats, Butter-flies, &c. and it is the cold winds and frosts that destroy them; yet I will grant that moisture accidentally hurts, *viz.* as it introduceth too much frigidity, or if it be too much in their meat, it may cause fluxes, rottings, &c. as it doth to Conies, Guiny-pigs, &c. As for *Bonveil* who hath writ of Silk-worms, I have both read him, and commend him; *Libavius* also I have, and even all his many Volums: but in my opinion he hath written *Multa, sed non Multum.*

Sir Ja. Craig.

Animad-

Animadverſor. Saſſafras, Sarſaparilla, and Snake-weed, I am ſure will not grow to purpoſe.

Firſt, why not? I am ſure that *Saſſafras* groweth in the Northern Plantations of *New-England*, even as far North as *Sacho*, where the Snow uſually lyeth five moneths, and the Winter extream bitter in reſpect of *England*: and further this *Saſſafras* is not a ſmall plant or ſhrub eaſily nipt with the froſt, but a great Tree, ſo that boards of ten inches Diameter have been made thereof; and further, where it once groweth, hardly to be deſtroyed: ſo that it much annoyeth the Corn by its young ſhoots, and the Mower in Harveſt more then any other Tree that I heard of in that Countrey. I was informed that the Native *Indians* of the place, when they loſe themſelves in the Woods, preſently run to theſe ſmall ſhoots, and thereby know which is North and South. Indeed I have obſerved that one ſide is more ſpeckled then another, and perhaps other ſmall ſhoots of plants are ſo, but not as yet obſerved (for ought I know) of any. This Plant is not ſufficiently deſcribed by *Gerrard*, *Johnſon*. *Parkinſon*, or any that yet I have ſeen.

For firſt, They ſpeak not of any flowers, and yet it hath fair, white, large flowers, almoſt as big as *Roſa Canina*, but I perceived little ſmell in them, though all other parts of this Plant, as leaves, bark, wood, and root eſpecially, are very odoriferous.

Secondly, They mention not the ſeeds which are about the bigneſs of Bay-berries, many of which I ſent out of *New-England*, ſome of which grew in *York*-Garden at *London*, but through miſhap periſhed.

Thirdly, This tree is not alwayes green, as *Parkinſon*, *Johnſon*. ſaith, but in *New-England* caſteth its leaves. Perhaps in *Florida* it may perpetually be green; for I know that in *New-England* the wild-Bays (which is like our common bays in ſmell and leaves) caſteth its leaf in Winter, as alſo a kind of Fir about *Caſco-bay*, (out of which is extracted a very odor ferous gum) and others in like manner, &c. In *New-England*

divers in the beginning of their plantations, uſed this Plant in their Beer, hoping that it would have ſerved both for mault and ſpice, but it deceived their expectations. For in my apprehenſion it giveth a taſte not pleaſant, and alſo they that accuſtomed themſelves to this drink, eſpecially in the Summer found themſelves faint and weak, not able to endure labour.

Animadverſor 2. *Sarſaperilla will not thrive in England, &c.*

Firſt, *Smilax* (to which this is referred) is two-fold.

1. *Aſpera*, which is not found as yet with us.

2. *Levis*, or *Convolvulus*, this groweth naturally wild with us, whoſe leaves though they differ much from the former, yet the root is very like, as I have ſeen them compared together; and further the vertues alſo; as I have been credibly informed by divers ingenious Apothecaries.

2. This *Smilax aſpera* is found not only in *Peru*, *&c.* But alſo in *Virginia* (as I am informed by divers) which is a Country whoſe Winters are far more piercing then in *England*.

3. In *New-England* I have ſeen a Plant with good ſucceſs uſed for *Sarſaperilla*, which is a plant about one foot and a half high with an upright ſtalk, with ſome few leaves at the top; I at firſt ſight, thought it the plant called *Herba Gerardi*, but the root is very like the *Sarſaparil*, commonly uſed with the pithyneſs, which maketh me to think that there are divers *ſpecies* of theſe *Smilaxes*; ſome of which may well thrive and proſper in *England*, eſpecially thoſe that grow in *New-England* and *Virginia*, but concerning this plant and divers others, which grow in *New-England*, I cannot give you that account I deſire, becauſe my ſeeds and papers unhappily miscarried.

Animadverſor 3. *Rattle-ſnake Graſſe will not thrive, &c.*

Parkinſon, an able *Botanick*, ſaith it flouriſheth with us in *June* and *July*, and therefore what ſhould hinder it from thriving to the purpoſe?

2. *Virg*

2. *Virginia* (as I ſaid before) hath ſharper Winters then *England*, and yet there it groweth abundantly in the Woods without cultivation, why not with us therefore by good managing and art? When I was in *New-England* I was acquainted with an ancient Gentleman, who alſo was a Scholer, and had lived ten years in *Virginia*, who certified me that there were two ſorts of *Rattle-ſnake-Weed*, the greater, and the leſs. That which he called the greater I caſually had in my hand, it was a bulbous plant, about the bigneſſe of a Pigeons egge, and milky in the root, it grew in the water, and the leaves like *Piſtolochia*: he told me that this was accounted the beſt; the ſecond is called the leſſe; and according to *Parkinſons* deſcription the leaves are like the former, but the root is fibrous, and this is that which is commonly brought for *England*; and for my part I ſuppoſe, and upon good grounds, that not only the former, but alſo the latter will thrive with us. I have oft deſired many of my friends and acquaintance to ſend me this plant, and divers others which grow even at their doors, but could never prevail ſo far with them, and have far greater hopes of the flouriſhing of this wild plant, that of Tobacco, (either of that which in *New-England* is called *Poak*, much differing from the *Virginian*, or of that other commonly uſed and ſown in *Virginia*) for they grow not naturally in theſe places, and yet Tobacco ſo flouriſheth in *England*, that it pleaſeth the State to take notice of it, and by an Act to prohibit it. And though I cannot deny but God hath given his peculiar bleſſings to every Countrey: yet it doth not hence follow, that nothing which groweth in an hot Countrey will thrive in theſe more Northern Climates; for moſt of our curious plants, as *Apricocks*, *Peaches*, &c. *Flac. Peruvianus*, *Juca*, &c. came at firſt from hot Countreys, yet thrive well with us: yea true, *Rhenbarb*: (if we will believe *Parkinſon*) which formerly hath only grown in the *Eaſt-Indyes*, groweth abundantly with us. This I am ſure, if it be not the ſame, it is very like in vertue: and daily we find that things brought out of a hot Countrey do flouriſh with us, as lately the great *Spaniſh* Cane (much uſed by Weavers and Vintners.) Maſter *John*

Tradeskin brought from the Western-Isle, and it flourisheth well in his Garden, and groweth great and tall.

Animadversor. So of Pines and Cedars, &c.

I wonder that the Animadversor should question the growth of Pines in *England*, seeing they grow commonly in the Plain of *Poland*, as *Cromer* saith, and the Pitch-tree is a kind of Pine growing even in the coldest places. In *New-England* I have seen Pines above four foot Diameter, and the length accordingly, even in the most Northern places. Further, these commonly grow in the Gardens about *London*: so concerning *Cedars*, they grow of a very great heighth and bigness in the Northern parts of *New-England*, where snow lyeth five or six months, and therefore I do not any wayes question their growing with us: and do again note that the neglect of these as also of the Fir-tree, is a great deficiency in *England*; and to what a straight our State might now be driven for Masts, did not *New-England* furnish us? as also for Pitch and Tar, is well known. And yet these Trees will grow in very barren land, and are sweet growers. Yea, as it appears by our Mosses they have formerly grown in *England*. Further, many will stand in a little ground, so that I dare boldly aver, that one thousand Acres planted with these Trees would in forty years serve this Isle with Masts for ever, and help us to great quantities of Pitch and Tar; for where these Trees once take, they are very hardly destroyed, as I have observed in *New-England*, where on an Isle every year in Summer, the Planters spent a day or two to cut them down, that the place might pasture the better for their young Cattle, but these Trees did presently grow again, so that they gave over their intentions, seeing their labour fruitless: but whether or no these Cedars (which are both white and red) of *New-England* and *Barmudaes* be the same with those of *Libanus*, which are *Coniferæ*, I will not dispute, or whether they be a kind of *Juniper*, as *Parkinson* saith; so far as I have observed the leaves of the smaller shrubs are rough and prickly, and the berries not only the Junipers.

Animad-

Animadverſor. Lucerna is without doubt Medica veterum, *and well known.*

I much queſtion it, for firſt *Johnſon*, and *Gerrard*, and *Parkinſon*, our beſt Herbaliſts do rather think *Medica veterum* to be Saint *Foin*.

2. Though I have had above twelve ſorts of Medicaies, yet they are all Annual, and our Herbaliſts do not mention any other Medicaies; But be it ſo, as the Animadverſor ſaith, yet neither the Plant *Lucerna*, not ſo much as the name was known to us, til I mentioned it in my Letters to M. *Hartlib*, neither did ever any ſow it in their fields, as the Ancient have done.

Animadverſor. Lupines known to all, &c.

I grant that amongſt our Gardiners are divers ſorts of *Lupines*, great and ſmall with blew and yellow flowers; which as I ſuppoſe may differ as our Peaſe and Tares, and therefore require divers ſorts of land; but I ſay that theſe *Lupines* are totally unknown to the Husbandman, and never uſed for that end, the ancient *Romans* uſed them, *viz.* to fertilize their land, as in *Kent* ſome uſe rares. In *New-England* I found the ſmall blew *Lupine* growing naturally on a dry white ſandy Plain, and therefore think that that ſort is more natural for the end above mentioned, then the great *Lupine*, I hope in little time to experiment ſomething in this kind.

Animadverſor. Grout is made of Barley or Oats, &c.

I know that we have a great kind of Oatmeal, which we call Grots, but this Grout which I mean, is a ſmall round thing, it cometh over to us in *Holland* ſhips, and I ſuppoſe it a kind of *Millet* or *Panick*, but wonder how it comes to *Holland*, becauſe thoſe Grains grow not there; but if it be made of Oats or Barly, the way to make it ſo round & ſmal is unknown to us: I read in *Parkinſon* of a kind of Rice ſown in *Germa-*

ny, perhaps it may be of that kind; for I have found, as I ſuppoſe, ſome of the grains unhusked, which to me ſeemed to be like very ſmall rice, I would willingly know the truth of this, whether I be miſtaken or not.

Animadverſor. The two laſt ſorts made only of Cows milk.

I ſuppoſe he meaneth *Angelots* and *Holland* Cheeſes, and that *Parmiſans* are made of other milk then Cowes milk. If ſo, that Animadverſor, I dare ſay, is miſtaken; for I have enquired concerning *Parmiſans*, even to *Lodi* in *Millan*, where the beſt are ſuppoſed to be made, and yet never heard any affirm that any milk beſides Cows milk was an Ingredient to them: and further all the Lands in thoſe parts are very improper for ſheep, the Countrey being a low flat Countrey, which they float three or four times every year, and by that means do mow as often; neither did I ſee any conſiderable flocks of ſheep. As for Mares milk that is improper for cheeſe, though many good Houſe-wives in *England* think, that the ſtrength and ſtrong ſavour of *Holland* Cheeſe proceeds from hence, but as I have formerly touched, falſely: perhaps there are ſome in other places, who to excuſe either their negligence or ignorance, report the fame of *Parmiſans*, but they are deceived: As concerning *Angelots* and *Parmiſans*, I muſt ſay (though I am unwilling to diſparage our *Engliſh* Houſwifery, further then is right) that to my apprehenſion the *Angelots* of *France*, which are made in great abundance, are better far then our *Cheſter* Cheeſes, and alſo our *Banbury*; as for our *Cheddar* Cheeſes which are made onely in two or three pariſhes in their number ſo ſmall that they are ſeldom ſeen, but at ſome Noble-mans table, or rich Vintners Sellars, that they are even nothing conſidering the great quantity of Cheeſe which is made in this Iſle. Neither do I think they tranſcend the *Parmiſan* or ſome *Angelots*, but I leave this Controverſie to every ones palate; that being very excellent to one, which is very little worth to another: and I can truly affirm, that it is a great deficiency even through the whole Iſle, if theſe *Cheddar* Cheeſes

Cheeſes be ſo good that there are ſo few made, the Paſtures in that Country not exceeding other Counties in *England*; nor breed of Cattel better. Neither is the price of *Angelots* at two Sous for half a pound, a vile price (as the Animadverſor ſaith) conſidering the Cheeſes are uſually ſold green; further I have ſeen ſome few *Angelots* made in *England* after the *French* manner by ſome curious Ladies of tranſcendent goodneſſe, according to mine and divers other palats: and I ſuppoſe, that other ordinary Houſewives might make the ſame, if they knew the Art.

Animad. The Animadverſor ſeemeth to taxe me, that I account the difference of Climates and of Soils the onely cauſes, why ſome places produce ſuch and ſuch plants abundantly, other places not, (if I miſtake him not) concerning which I ſhal briefly and plainly declare my mind: and do affirm that I think, where the Climate is the ſame, and the temper of the Soil equal, in ſuch places all plants will equally thrive, but if the Climates vary either in heat or cold moiſture or drineſſe; or the Soil in fruitfulneſs, barrenneſs, or in moyſture, drineſs, or in ſtifneſs, lightneſs, ſandyneſs, clayiſhneſs, or in ſuch circumſtantials, then is there alſo a variation in the well or ill thriving of plants: and further I ſuppoſe that whatſoever plants thrive in one hot Countrey, they will alſo thrive in another, if there concur the like moyſture and ſoil (the ſame cultivation being ſuppoſed) this plainly appears in Oranges, Lemmons, (which the *Spaniards* have planted through all the *Weſt-Indyes*) Olives, Vines, &c. And on the other ſide, what thriveth in one cold Countrey, (*cæteris paribus*) thrives in all others, as it appeareth in *Norway*, *Poland*, *New-England*, *Ruſſia*, *New-found-land*, where Firres, Pines, Pitch trees, &c. grow abundantly, and ſo what thrives in our temperate clime, thrives in all, as is manifeſtly ſeen in Apples, Peares, Cherries, Wheat, Barley, and almoſt in all Grains and Seeds in Botanick Gardens. And I can ſee no other cauſe worth the ſpeaking of, but the afore-mentioned. Yet I grant that hot Countries have their peculiar plants, which will very hardly thrive in cold Countries, becauſe of the nipping froſt, yet the

the froſt being rebated they will thrive well; and by this means I have ſeen ſix miles from *London* in *Surrey* Orange trees flouriſhing and growing even to the greatueſſe of Trees in that kind in *Italy*, with ripe fruit continually on them, alſo with bloſſoms, &c. Likewiſe cold Countries have their peculiar fruits and plants, which cannot endure the ſcorching heat of the Sun, and therefore the Herb called *Lanchitis*, and others which grow abundantly in cold Countries, and in the Royal Garden at *Paris*, as difficulty preſerved in *Mompelier* Garden, as Oranges, Olives, &c. are preſerved in the cold Coun-

De la Broſſe. tries. As for occult proprieties of the earth, for Sympathyes and Antipathies, ſecret influences of Planets benigne aſpect, &c. I underſtand them not, but dare boldly affirm, if I have a convenient Clime, and a Soil correſpondent to the nature of the Plant, to cauſe any plant to thrive and proſper; and this we ſee by experience, that if Rye, &c. be ſown in a dry ſandy ground, whether in *Poland*, *England*, *New-England*, which are many thouſand miles diſtant, yet it will thrive and proſper, *& ſic de ceteris.*---- As for Aſtrology, to the which all in theſe dayes are too prone, even Gardiners and Husbandmen, will be talking of the dark of the Moon, and of the increaſe and decreaſe of the *Solar* and *Lunar* Ecclipſes; and accordingly diſpoſe of their ſeaſons, of times to their great damage; for I my ſelf even by experience have found folly in theſe things, for things ſown in the great Ecclipſes both of the Sun and Moon, have thriven as well as other things: in the decreaſe as well as in the increaſe, and therefore wiſh all men to ſow their ſeeds when the ſeaſon appointed is come, without ſuch vain obſervations: For this Art for what I can perceive, is no way demonſtrable *à priori*: for who can prove 12 Signes, Fiery, Watery, *Domus Planetarum*, *Dignitates*, *&c.* which are the main pillars of this Art: and *à poſteriori*, by calculations it is made more uncertain, for though much is undertaken by divers, yet little is effected, many untruths for one truth, and little prognoſticated, but what a prudent man without adviſing with the Stars may foreſee. In brief, I will declare my rude thoughts, which perhaps will at length be found

found truths, for light breaketh forth a pace: In the beginning the wise Creator made two great Lights for the use of this Sphere of the World, the Sun, and Moon; the Sun to enlighten and to warm, and refresh all things, and to rule the day; the Moon to rule the night, and to be for the distinguishing of times and seasons; the Sun being the Center imparts his light to the Earth and Moon, also to *Venus* and *Mercury*, (for they are found by the Selnescope to increase and decrease as the Moon doth) and also it is probable to *Mars*, and *Jupiter*, and *Saturn*, and scarce further; for the power of all created things are finite, as the Moon being nighest reflects its light on us, so its probable that the Earth illuminates the Moon. *Mars*, *Jupiter*, *Saturn*, have their Lunars or small Stars moving about them, which have lately been discovered (the Ancient knew not thereof) which its probable are for the distinguishing of times and seasons for the Inhabitants of those parts. Those which we call the fixt Stars are very great, many of which because of their great distance cannot be discovered but by the Glass called the *Telescope*, and therefore surely have little operation upon us who are in another Sphere, so far distant from them, and amongst these its probable some are Solar bodies, because of their twinckling, others terrestrial, which are replenished with creatures endued with life, by the fountain of life, which creatures do, as the creatures in this earth continually set forth the infinite Greatnesse, Glory, Mercy, and Goodnesse of the Creator; and these words are even infinite, for the infinite Creator hath made an infinite Work worthy of so great a Workman, transcending the narrow capacity of frail mans intellect, and if things be thus, Astrology is vain, &c. but I wonder some will say, *toto Cœlo*, but its no matter: *ad propositum*. *Cusan Hill. Brunn.*

Animadverser. He is much mistaken if he think that those things reckoned up page 82. *will prosper in England, especially Ivye, Cork, Scarlet, Oak.*

I answer, Perhaps not much mistaken; things far improbable

bable have ſucceeded; and again I aver that I believe they will, and ſhall believe ſo, till experience prove the contrary. And firſt for *Rice*, which firſt came from *Babylon*, and the *Eaſt-Indyes*, and is in thoſe places their uſual bread, where they have uſually two or three Crops every year, yet we ſee it can condiſcend now to grow in the North parts of *Italy* in *Lombardy*; yea it hath ſtept over the Mountains, and is come even as far as *Tours*, which is in the midſt of *France*, where it growth and eſpecially delighteth in moiſt moriſh grounds; alſo if may believe *Parkinſon* a good and painfull *Botanick*, either Rice, or ſome thing ſo like Rice, that he puts it in the ſame *Chapter* with it, grows in *Germany*, and therefore I queſtion not but we in *England* might have one good Crop of this Grain in our Moriſh Land yearly; for the reaſons that this will thrive with us, to me are more ſtrong then that *Coriander*, *Sweet-fennel*, *Caraway*, *Canary-graſs*, the *Great-Cane*, &c. will thrive, and yet theſe of late begin to flouriſh with us very well.

Cork-tree. I very little queſtion the growth of this. For firſt theſe trees grow abundantly in *Biſcay*, a Countrey far colder then *England*, where the Summers alſo ſcarcely mature the grapes: Likewiſe they grow in the North of *New-England* at *Parcato*-way. Further that Tree is a great hardy bearing Acorns, and leaves like to an Oak, that one may eaſily be deceived by it, and miſtake it for the common Oak.

Scarlet Oak, I hope, I ſhall make it very probable, that even this alſo may flouriſh in our Iſle: In *Latine* it is called *Ilex*, of which there are divers ſorts. Some greater, ſome leſs, ſome more, ſome leſs beautiful: the greater ſort which indeed beareth little of the *Chermes* groweth very well in *England* to a great Tree, and beareth Acorns, one of which I have ſeen at *Whitehall-Gate*.

2. Maſter *Parkinſon* reporteth that in *New-England* and *Virginia*, &c. The ſmaller *Ilex* (which is fruitful of *Chermes*, if it be cultivated) groweth naturally.

3. This Scarlet Oak groweth not onely in *Languedock*, and the

the hotter parts of *France*, but I have ſeen it alſo in *Paris* royal Garden grow without much art or induſtry.

4. Divers Plants though at firſt they difficultly thrive, yet when they are habituated to the Countrey, and to caſt their ſeed there, thrive well: Thus I have obſerved that *Virginia* Wheat at firſt difficultly thrived in *New-England*, but the ſeed that matured there the next year, flouriſhed very well: the ſame I obſerved of Wheat brought from *England*, of water *Melon* ſeed brought from the Weſtern Iſlands: the like I obſerve in *Ireland* of Oats and Barley ſown before *December*, the Winter kills much, but what endureth and ripeneth, is hardened for the next Winter, and flouriſheth, &c.

5. There may perhaps other *Species* be found of this Scarlet Oak, more proper for our Climate, and I remember that on the barren plains in *New-England* I have ſeen growing even every where a ſmall Oak, ſeldom above two foot high, yet laden with ſmall Acorns, which are indifferent good to be eaten, and are the ſpecial food for the wild Turkeys in Winter, the leaves differ little from the common Oak but are ſmaller: ſome of theſe ſmall Oaks being cut up nigh to a Damme made to turn a ſmall river for the iron works, I perceived that out of the young twigs (which I never before perceived in the old branches) many excreſcences did break forth, ſticking cloſe to the bark, flattiſh, reddiſh, ſet in order like buttons on a Dublet, the lower-moſt biggeſt, and ſo by little and little leſs and leſs, the bigger ſort bigger then Vetches. Theſe excreſcences likewiſe grew on every twig double, one range oppoſite to another: I, in *September* when the leaves where fallen, for ſooner I did not perceive them, gathered about a pint, hoping that this Oak might be of the ſame nature with the Scarlet Oak, though much differing in leaves: but my miſhap. I loſt my berries, and never ſince could obtain more: For theſe reaſons therefore I believe, and I hope others will ſo far, as to endeavour by experience to find out whether the Scarlet Oak which is a conſiderable Plant, will thrive amongſt us.

Animadverſor. I wonder Linden-trees, &c.

Linden-trees are not mentioned as not growing in *England*, for I know that they grow in many places, and in *Cobham* Park in *Kent* they make the ſtatelyeſt Walk I ever beheld, but Gentlemen only plant them for pleaſure. Whereas in other places they make Baſſe Roap of the Bark, &c. which is no where done in *England* that I can hear of.

6 Letter. Amber onely found in Pruſſia.

THis will upon ſtrict enquiry be found otherwiſe, for many report Amber to be found alſo in conſiderable quantity in *Pomerland*. *Cromer* alſo in his diſcription of *Poland* ſaith it is found in divers Lakes with them, eſpecially at *Piſcia*; alſo that in other places they uſually dig it up; alſo Maſter *Cambden* an approved Author for *England* ſaith in his deſcription of *Norfolk*; and alſo Jet and Amber, which (ſaith he) I willingly omit, ſeeing that there is great ſtore of theſe things elſewhere along the Coaſt. Alſo that Jet or black Amber is caſt up at *Whitby* in *Yorkſhire*: Further I have ſeen long pices of a yellow tranſparent Stone, or Amber found in a Fountain nigh Lake *Neagh*, about ſix miles from *Antrims* which the *Iriſh* ſay (though vainly) that it is found only there on *May-day*, and doe uſe it ſuperſtitiouſly about divers things.

Animadverſor. Sea-Owſe will not make Brick, &c.

I have ſeen *Sea-Owſe* or *Mud* do it at *Dover*; alſo in *New-England*, and it it a common practiſe, and if I am not miſinformed that ſort of *Brick*, which in *London* is called *Flanders-brick* much uſed, for ſcowring braſſe, &c. is made of the ſame Material.

Animadverſor. Salt out of a Sand, &c.

Maſter *Cambden* reports it to be at *Wyre-Water* in *Lancaſhire*, *page* 753. where you may read it more at large, and alſo the

the same Author reports that at *Butterley* in *Durham*, there are saltish stones which serve the people for their use, *pag.* 734.

Animadversor. Not only the Odour, Taste, and Colour of Waters to be regarded, but other things of greater importance.

I for my part know not how Countrey-men should discern such transcendent virtues in waters, otherwise then by these wayes. I know ingenious men may make separations by putrifactions, distillations, &c. And further I suppose that water is of it selfe most *Homogeneus*, (Let *Faber* speak what he please in his *Hydrographo*) and that all the differences betwixt waters is accidental: *viz.* by the mixture of some vapours, fumes or *Saline* nature, which it receiveth by its long course throw divers Earths, Clays, Sands, Salts, Minerals, Metals, Stones, &c. and further that this mixture is most commonly perceived by our senses, *viz.* by Colour, Taste, Odour, and would be much more perceived by us, if we did drink water continually. For the use of things of high taste, causeth us that we cannot distinguish things of lower gusts. For I have known some who could strangely distinguish waters by their tast; and further in *England* I know no water of any considerable vertue, but an ordinary palate may distinguish it from the common waters, and usually they are discoloured, and have some peculiar odour: As for the Mechanical uses of waters, why some are fit for Brewing, Washing, others not. I suppose the reason is plain enough, but that Hatters cannot make good Hats, because the water is not good enough for them: or the Dary-maid make good Butter or Cheese, &c. I think these are but excuses by the which they usually cloak their ignorance or knavery.

Animadversor. I am sure that whosoever shall believe Glauberus, viz. *that in all sand almost Gold is found*, &c.

The Animadversor may think what he please, but I for my part (as I have formerly said) think *Glauberus* very ingenious, and a man of excellent experimental knowledge, and a man

of excellent experimental knowledge, and therefore am easily induced to believe it, considering that Gold is not only found in the parched sands of *Africa*, *India*, &c. but it hath been also found in many Rivers of *Europe*, as *Tagus*, *Po*, *&c.* yea in *Scotland*, Gold is found amongst their sands in divers places, some of which I have seen, and know two ingenious men who intended to have set up a *Mercury* Mill (as they called it) for the separation thereof, had not the troubles of these times prevented: Golden sands are also found in *Ireland* in *Ulster*, if the Author of the Natural History of *Ireland* speak truth.

Animadversor. Little fewel, save out of Ditches. Ditches an improper Word.

I suppose it not much improper, for I never saw either in *England*, *Ireland*, or elsewhere; fire as it were fisht out of the water, I mean that any place is so saving of their Land, and so industrious in sowing their Graffs and Ditches to get fewel as in that Countrey, which I note rather as a point of good husbandry to be imitated then to be discommended, yet I cannot call Turf more then indifferent good fewel, and really must say, it is inferiour both to Coal and Wood.

Animadversor. Durham-Wall, &c.

It is misprinted for *Durham-Walls*, &c. These places being sufficient for my purpose, I know twenty places more may be added. The expression concerning *Opium* and *Opiates*; I suppose very little too large.

Animadversor. Elephants cannot be of use.

Master *Cambden* saith in his Description of *Essex* that the *Romans* brought over Elephants to *England*, whose bones being found, have astonished many (perhaps the bone at *Aldermanbury* is one of them) also in our dayes an Elephant lived many years in *England*, therefore to me its probable they may be as serviceable to us, as to other places.

Animad

Animadverſor. An hard task to people with black Fox,&c.

I ſuppoſe the Animadverſor means to cauſe them to encreaſe with us, but I think the contrary: for black Foxes are found in *Ireland*, *New-England*, *Ruſſia*, and indeed in all cold Countries, therefore I ſee not why they ſhould not multiply. Musk-Cats likewiſe divers have kept in *London*, and with good profit, &c.

7 *Letter. All Plants ſublimed into Inſects are not medicinable, &c.*

I Do not poſitively affirm it, yet I know it is the opinion of ſome not to be deſpiſed; further that ſome have very conſiderable medicinable vertues, it is well known, and I have inſtanced in divers, and I ſuppoſe that as yet it is altogether unknown whether others have or not.

Animadverſor. Rottenneſs of Sheep known in Ireland, &c.

Rottenneſſe of Sheep is ſome times in *Spain*, but not ſo much known as in *England*, though the Countrey be moiſter; the reaſons now I well know, for they have not ſo many baſe wet Commons as in *England*, and the great Sheep-Maſters uſually chuſe their Sheeps-Walks, or Paſtures, on high dry Lands, &c.

Animadv. In Holland Cattle not houſed in Summer, &c.

Holland with us is uſually taken for the 17 Provinces, or at leaſt for the united ones, and that Cattel are houſed there as well as at *Paris*, you may read at large in *Flanders* husbandry, as alſo how they give their Cattel Turnips, and that they mow their Medows twice or thrice yearly, which the Animadverſor denyeth. How the *Hollanders* do hoard up, or bury grains, for that word is proper enough for any thing that is covered in the ground, the Animadverſor largely deſcribeth, and I hope it will be practiſed about *London*, where in the Summer time they are little worth.

Animad-

Animadverſor. Hogs are not cleanly but love dirt, &c.

If Hogs love dirt, then why do they not wallow it in Winter as well as in Summer, but it is well known that in Winter hogs muſt lye warm and dry in clean ſtraw, or they will not thrive, and why is it a greater diſparagement to hogs in the Summer to lye in mire, that thereby they may cool themſelves, take away their ſweat, and deſtroy their lice by rubbing when the dirt is dry, then for other cattel to ſtand and wallow in muddy waters, or for Poultry to duſt themſelves? And further an Hog much abominateth his own dung, and therefore will never dung nor piſſe in his Sty, if the door be open, in which particular he excels even all creatures, and therefore the Paradox of the Hogs cleanlineſſe may be found true.

As concerning the extraordinary bigneſſe of Gooſe livers it is in *Italy* amongſt the *Jews*, where I have eaten of them highly eſteemed, but at preſent not much in credit among the *Italians*, and to my Palate it is not ſo excellent a dainty.

8. *Letter. Animad. Purchaſe in his ſecond Tome, ſets down the making of Caveare, &c.*

I Am certain that *Purchaſe* himſelf, never ſaw the making of *Caveare*, nor the Merchant perhaps that wrote it, and therefore I muſt queſtion the Proceſs, and know that in *New-England* where there are abundance of Sturgeon, whoſe rows are ordinarily accounted the Material of it, yet never any ever ſo much as attempted to make it, though divers Fiſhmongers were there, and attempted to pickle Sturgeon, though with ill ſucceſs; for in the ſhip in which I returned from *New-England*, many Scores of Cags of Sturgeon were ſent to *London*, which were all naught, and cried about the Streets, under the notion of Holy Sturgeon: perhaps if *Purchaſes* way were known, it might encourage ſome to attempt the making of it. If I had *Purchaſe* by me, I would write it forth and publiſh it: at preſent his Works are rare and dear.

The

The Animadverſor doth very well deſcribe the manner of feeding Cows with Turnips, *p.*113. I hope our Gardiners will take notice of it, and practiſe it, for it may be much for their profit, and for the advantage of many poor people.

9. *Letter.*

I Wiſh alſo that the breeding of Pheaſants, as the Animadverſor ſets down were better known, for many poor might get good living thereby, as divers do in *Bark-ſhire*, and about *London*: I know alſo other Noble men, who keep many of theſe fowls; as alſo a poor man in *Ireland*, who hath a Pheaſant, Cock, and Hen, which run amongſt his Poultry, his Cocks tail of a very great length, which live very well, and lay eggs as other fowls without further trouble, and I queſtion not, but others might be made tame alſo in *England*.

10. *Letter.*

COncerning Cheeſe I have already declared my mind: *viz.* that *Parmiſans* and *Angelots* which are commonly made in *France* and *Italy*, are far beyond our *Cheſter*, or what we commonly make in *England*.

2. Our *Cheddar Cheeſes* are ſeldom ſeen, unleſſe at ſome Nobles mans table, &c. and yet I doe not think they excel *Parmiſans*; but whither my Palate be a true judge or not; I am ſure it may be noted as a great deficiency that ſo little excellent Cheeſe is made with us, ſeeing ſo much is made elwhere. The cauſe of this deficiency the Animadverſor referreth to the Water as appeareth by his examples. But I, and I ſuppoſe more truely to the good skill and clean handling of the Dairy Maid, and alſo to the difference of paſtures; for that good or bad Houſwifery maketh or marreth Cheeſe is very well known, as alſo that difference of paſtures in reſpect of ſweetneſſe and ſowrneſſe, much or little, freſh or ſtale, &c. cauſeth alſo great difference, not onely in the quantity, but alſo in the quality of Butter and Cheeſe. But that the difference

of water doth cauſe thoſe alterations. I very much queſtion, for I know that in *Kent*, whether the Cows drink puddle or pond-water, or clean ſpring, or freſh or brackiſh, (which in ſome place they oft do) yet the butter and Cheeſe are the ſame, if the Paſtures be alike. But if Paſtures vary, theſe vary, and ſo likewiſe I may ſay of the Houſewife: I know a Farm within a mile of *Graveſend*, where the Cattel alwayes drink at one common pond in the Yard, if they graze on one ſide of the houſe, the Butter is yellow, ſweet, and good, and Cheeſe alſo; but if on the other, the Butter is white, ſowriſh, and Cheeſe naught, and yet there is little difference in the paſtures to a vulgar eye, which hath cauſed the good Wife to report it as a wounderful ſtrange thing, whereas the cauſe is manifeſt, for the one ſide hath much Trefoil, and lyes on the Chalk; the other ſide is a gravel, and produceth uſually *Gramen, Caninum*, or Couch-graſs: ſo we find in ſheep which drink not, yet both their wool and fleſh vary very much in reſpect of paſtures. And I ſuppoſe that if the paſtures mentioned in *Holland* by the Animadverſor, were wel viewd by a judicious man, the like difference might be found, for as I ſuppoſe the Waters in *Holland* differ little, the Countrey lying for the moſt part in one even flatneſs without Minerals or Metals, the Country in Winter over-flown with rain-water, in the Summer time moſt of their waters brackiſh: But if it be otherwiſe, I ſhould be very glad to have ſome further light, and deſire ingenious men not to build upon vulgar report, for I know they are apt to make *Molehils Mountames, &c.* in the *Interim* I ſhall acquieſce in my own opinion.

Animadverſor. England hath a perfect Syſteme of Husbandry, viz. *Markham*.

He ſpeaketh more of *Markham* than ever I heard before, or as yet have ſeen. In general he is accounted little more than a Tranſlator, unleſs about Cattle; and yet I cannot but in that queſtion his skill: Conſidering how groſly he miſtaketh the names of Plants: The works which I have ſeen of his are, firſt, the great book tranſlated out of *French*, which whether well or ill done, I will not declare; but I am ſure our Huſbandmen

bandmen in *England* profit little by it. Secondly, I have ſeen five ſeveral bookes bound up together, two or three of which he acknowledgeth to be anothers, as *The Improvement of the Wild of Kent*, alſo his *Houſwifery* he acknowledgeth to have had from a Counteſs, alſo part of his *Farewell* is borrowed, and what he owneth, if I have ſeen all, are very ſhort in many particulars, as it will eaſily appear by my former diſcourſe, and *Blithes* book of Husbandry lately augmented and printed: Yea, if I underſtand any thing, he ſetteth down many groſs untruths, which every Countryman will contradict, *viz.* That Flax is ripe after Hemp; That Corn ſteept in Brine encreaſeth fivefold more than ordinarily; That *Lupin* muſt be ſteeped, when they were never ſown in *England*: He wiſheth Huſbandmen to let long Graſs grow amongſt their Corn; for (ſaith he) it keepeth it warm: Fullers earth as profitable as Marle: A ſack, or a ſack and a half of Rags for an Acre: Corn reapt in the wane nought: Hops not to be planted in too rich a ground: One Teame in one day to plough in ſtiffe land two Acres and a half, in light, four: Alſo one to man to mow two Acres of Graſs in a day; to reap and bind five rood of Wheat; of Fetches and Peaſe two Acres: Alſo one man to dig rake and level one rood the day, *&c.* And ſuch like which cannot be done: But I have ſaid, and doe confirme it again, that he hath done well in divers things, and is to be commended for his induſtry. *Farewel to Husb.*

Animadverſor. The Romans Law was onely for fining, &c.

My expreſſion doth not neceſſarily conclude that ill husbandry is *Crimen Læſæ Majeſtatis*, or Treaſon, but that the puniſhment was inflicted on them becauſe the publick received damage by their ill husbandry, being averſe or contrary to the common good.

Animadverſor. Holy Land not barren, Royer.

Our *Sands* reporteth it ſuch, and ſo it is commonly voted; but whether through a peculiar curſe of God, or for want of Cultivation, for we know that many hils would be very excellent for Vines and Olives, which notwithſtanding are

little worth for Corn or Paſture, &c. I will not here diſpute.

Concerning Fiſh-ponds, Angling, &c. I could wiſh we had a good Treatiſe in Engliſh: *Vaughan* was commended to me for them, but I have not read him, and therefore will not ſpeak much for him, &c.

Thus at length I have run over all, if any thing be impertinent, as I fear divers things are, I deſire you to expunge it.

An Obſervation concerning a Fiſh-Calender imparted from Zurich 11. *Nov.* 1654.

There is an exact Fiſh-Calender printed in the Low-Country, but whether it be reprinted every year I cannot tell. I was enquiring here whether they had no ſuch curioſity: One told me that there is a Catalogue extant of all the ſorts of Fiſh ever taken in their Lake, or Sea, as they call it. When I asked whether their ſeaſons were not added, he could not tell: But ſaid, that in their Stat-houſe they have the twelve Months painted, and that under every Month are expreſſed in picture, without any names ſet by them, the ſeveral ſorts of Fiſh fit to be then eaten. I have not ſince had leiſure to go ſee thoſe pictures. If any think this a needleſs, or an Epicurean Curioſity, let them read Doctor *Boates* Natural Hiſtory of *Ireland*; where he imputes the Iriſh Leproſie to their brutiſh eating of Salmons, when the very eye would have made them know they were unwholſom. But, ſaith he, the Engliſh having diſcovered it, did under a penalty forbid the ſelling or taking of Salmons at that time of the yeare: whereupon in a few years after, it was as rare to finde a Leper in *Ireland* as in any other Country.

A Copy of the Letter wherein the following Diſcourſe entituled *Mercurius Lætificans* was ſent enclоſed to Mr. *Samuel Hartlib.*

SIR,

YOur cordial love to the kingdoms good being ſo clearly expreſſed to the world, not onely by your pen, but alſo by your conſtant practiſe in promoting of all good deſignes which tend to the generall good of the Commonwealth, hath emboldened me to ſend you this enclоſed Copy, deſiring that you will be pleaſed to take care that it may be forthwith printed and publiſhed, together with this Letter: Neither need you fear any diſhonour by promoting of this laudable deſign: for I have ſhewed the Copy to the Learned as well as the unlearned, to the rich as well as the poor, and all approve of it, and deſire to have it as ſoon as it ſhall be publiſhed. They think it is a fine experiment to make good bread of an old ſtone: And though they differ in opinion concerning other affairs, yet they all love to eat bread with one conſent; and if they ſhall agree to practiſe according to their profeſſion, which is to do their beſt endeavours to further the good of the publick, then certainly the cards will turn, and we ſhall win our money again by concord, which we have loſt by diſcord, yea and twice as much more. And though many of theſe things which I would have to be put to the beſt uſes, ſeem to be trivial, that is for want of underſtanding in the Readers; for in Genoa *as I have been credibly informed, it is an uſual practiſe to buy barren Land for little or nothing, and to carry good earth to it, and cover it ſo deep, as a ſpade or a plough may work upon it; but this practiſe would never countervail the firſt charge, unleſs they did uſually practiſe another ſtrange work, which is ſo common there, that if an horſe or a beaſt doe dung in any ſtreet, or high way, it is a marvel if ſome boy or girle doe not take it up, before it be cold, ſo carefull are they that the fertility of the Kingdom ſhould not be diminiſhed: And though theſe boyes and girles get nothing but pinnes and*

points,

points, or some other trifles, yet in the general the whole Countrey is made rich and plentifull: Even as we see in a Bee-hive, though every Bee bring but a drop of honey at a time, yet it maketh up a weighty masse, and many of those masses put together do make up the great masse, which I have seen at Sturbridge Fayre, *which is able to amaze a man that beholdeth it.*

When this Book is published, then I desire you to think of the best way you can possibly imagine, that all the Inhabitants of the whole kingdom may have knowledge of it generally; for knowledge that concerneth the publick good, ought not to be concealed in the breasts of a few. As for the large Book to which this little one hath relation, there is no thinking of publishing of it, till we have obtained a Committee to examine Witnesses, and to print their Depositions in it; for Projectors have cast so many bitter things into the publick Fountain, whereof all have drunk, and their minds are so poysoned, that that there is no other way to unpoyson them, but to win their belief and willingness to practise, but such depositions of Gentlemen of quality, which know the same as well as I my self, and some of them have taught me, and I have taught others several Secrets, and some few I know my self still, and no man else in the Kingdom, for ought that can be proved; all which reserv'd Knowledge in particular breasts, is against the Wealth of the Publick, and therefore ought to be made common to all, or else this Design cannot prosper, nor the Kingdom flourish according to my desire. As for your particular Encouragement I need say no more, but that by furthering of this friendly Advertisement, and the perfecting of the Books to which it belongeth, you shall become a Further of the most Charitable Design that is now on foot in England, *besides the great and manifold Benefit that shall redound thereby to the Commonwealth: For I dare undertake that* by the right Improvement of the several Directions and Experiments that shall be discovered, you shall undoubtedly cause more naked to be cloathed, more hungry to be fed, more poor Virgins to be preferred in marriage, than *Suttons* hospital, the *Savoy*, or all the Hospitals, or Liberal Gifts in *England* have ever performed. *So I rest,*

Westminster this 14, of *May*. 1644.

Your Bounden Servant, *Gabriel Plattes.*

Mercurius Lætificans.

WHen I peruſed the ſeveral *Mercuries* which goe abroad, to wit, *Mercurius Civicus*, *Merc. Aulicus*, *Merc. Britanicus*, *Merc. Cœlicus*, *Merc. Veridicus*, *Merc. Vapulans*, *&c.* I was ſorry that ſo much Wit, Labour, and Study ſhould be ſo ſlighted, and produce no better effect; for I have ſeen them before they were a week old to be careleſly hurled up and down, and ſometimes torn in peeces to light Tobacco, and other uſes not fit to be named. Whereupon I reſolved to try a Concluſion, to write a *Mercurie* that no man ſhould ſo abuſe, but he that is an enemy to himſelf and to the Common-wealth. And therefore I have ordered the matter ſo, that no man in the Kingdome, which hath ſo much learning as to read it, or ſo much underſtanding as to hear it read with attention, but he may learn to gain a thouſand times the price of it to himſelf, beſides the general good to the Publick. But before I tell my Readers what laſting and particular Benefit they are to expect, if they will follow thoſe Directions which ſhall be given them by the following Diſcourſe: Let all men that love themſelves, or the Common-wealth, and Poſterity, take ſpecial notice of a certain Book of Husbandry, intituled, *The Treaſure Houſe of Nature unlocked, and ſet wide open to the world*, *&c.* where they may plainly ſee, that as God is infinite, and men are infinite by propagation, ſo the fruits of the Earth for their food, and cloathing are infinite, if men will conſent to put to their helping hands to this commendable Deſign.

The ſumme of the Book conſiſteth in ſhewing how this Kingdom may maintain double the number of people which it doth now, and in farre greater plenty: Containing many rare Secrets for the Wealth of Men, and ſuch as will ſeem ſo ſtrange, and incredible to moſt men, that they will be likely to ſlight it, to the great prejudice of the Common-wealth.

Whereupon I am reſolved to wait the Lord of Heaven and Earths

Earths leasure, till such time as he shall be graciously pleased to afford so much leasure to the high and honourable Court of Parliament to hear such Witnesses as I shall produce, to the end that the Depositions being printed in the same Book, every Subject in the Kingdome, as well in great Cities and Towns Corporate, as in the Country may be satisfied concerning the truth thereof, and so be more apt to yeeld unanimous consent, which is all that is wanting for the full accomplishment of this laudable work.

And I wish no man to think that this is a device to exhaust his purse; for the truth is, I wrote the same for no other cause, but because I saw that all those Books which were formerly written upon this subject, were written by men which had not attained to any considerable *Perfection in the Knowledge of Nature*, and such as had but a glimmering light of such great Secrets, as Nature hath heretofore locked up in her Store-house, and so were ignorant in the fundamental points and causes of Vegetation and Multiplication. Whereupon I concluded that the Teachers and the Teached were nothing else but the blind leading of the blind, by which we all fell into the ditch: I mean, we lived in want and misery, when we might might more easily have lived in plenty and prosperity.

As for the particular way whereby this wonderful Improvement may be brought to passe, here is no room in these few leaves: therefore I will only shew how every one in the Kingdom, as well in great Cities as in the Country Towns may be an helper in this happy work, and raise some considerable gain to himself, and that great Cities which in former times devoured the fatness of the whole Kingdom, may yeeld a considerable retribution yearly without any mans prejudice, so that the fertility of the Countrey needs not be so much diminished as in former times.

And therefore every one is desired to take this one thing into consideration, that as any parcel of good land, being kept in Pasture, and having the dung which it breedeth spent upon it, doth continue fertile for ever, without any other addition, so the excrements and materials which any family produceth,

duceth being wel contrived, will produce yearly as much bread and drink as that family ſpendeth for ever.

But the better to ſtir up all poor maid-ſervants to put their helping hand, let them be pleaſed to underſtand, that I taught a poor woman to get three pounds a year, which ſhe hath continued many years without any conſiderable labour, or neglecting her other occaſions, and thus ſhe practiſed.

When ſhe waſhed, and ſwept rooms at her neighbours houſes, inſtead of caſting many materials to the common dunghil, ſhe took them home with her at night, and laid them in a corner, and once a year ſhe ſold them for above three pound. Beſides ſhe laid aſide every year as many linnen rags as yeelded her forty ſhillings, and her labour, in receiving her five pounds from the Bargeman, or thereabout every year, was almoſt as much as all her other labour, I mean extraordinary labour.

If young poor Maid-ſervants will imitate her induſtry, I will tell them the whole Secret, to the intent that beſides the benefit to the publick, every one may get her ſelf a conſiderable portion; and to the end that many may be induſtrious in this laudable way, and that many thouſands may remember me in their good wiſhes, I will firſt ſpeak a good word for them to all generations to come, to wit, that ſuch an one, which by her wit, induſtry, and providence getteth her ſelf a portion of twenty or forty pounds (which ſhe may eaſily doe in a certain number of years, not very many) deſerveth as good a marriage as one that hath an hundred pounds given her by her parents and friends.

And to the end that this may not ſeem to be a ridiculous relation, I will ſhew the reaſons of it, and alſo the experience, and laſtly declare the ſeveral materials which I taught her to reſerve.

As for the reaſons, they are thus diſcovered, *viz.* the vegetable ſpirit of the world, by which all things do encreaſe and multiply, is ſometimes cloathed with a groſs and earthy fœculencie, as in dung, and more in ſome dung than in other: ſometimes it is more purified from its earthly fœculency, and then

it is far more effectual, as we ſee by experience in *London*, that a load of ſhavings of horn is ſold for fifty ſhillings, or three pound a load, wollen rags is ſold for thirty or forty ſhillings, when as a load of common dung is ſold for a penny, and many times for nothing but carriage away.

Now I proceed to declare the ſeveral materials which I taught her to reſerve: As for the linnen rags, ſhe reſerved thoſe before I knew her, and ſold them yearly to the Paper-Mils; and I ſeeing her induſtry, thought it a good deed to adviſe her to reſerve all the ſhreads and rags of woollen cloath as well old as new, all the ſhreads and pieces of leather of all kinds as well old as new; all the horns and hoofs of beaſts of beaſts of all kinds, whether ſhaven or not, that came in her way; all the hair either in Barbers ſhops or Tanners yards, or at the houſes of Butchers and Cooks, where they ſcalde many hogs and pigs, and fondly caſt away the hair; and to take up all the old ſhooes and peeces of leather which happened in her way, as ſhe went about her ordinary occaſions, and to work as often as ſhe could, at the houſes of Taylors, Shoomakers, Sadlers, *&c.*

For I have found by experience, that a load of the beſt common dung will not produce corn worth above twenty ſhillings at three crops, unleſſe corn be very dear, and if it be far carried, then the labour, rent, and ſeed, will conſume the gains, whereas a load of any of theſe materials formerly mentioned, will produce Wheat and other corn worth above ten pound, though the price be reaſonable.

Theſe things being well conſidered, there is a great reaſon why theſe materials ſhould not be fondly caſt away to the common dunghill in great Cities, or other places, whereas the greateſt part thereof is utterly loſt; and though ſome of them goe to the dunghill, yet they ſerve onely to enrich land which lieth near to great Cities, where there is no need of them, whereas being reſerved by themſelves, they will quit the coſt to be carried twenty or thirty miles, and ſo make land fertile, which beareth not halfe the quantitie for want of dung.

And

And whereas I have found by experience, that a load of any manner of ſeeds whatſoever, doth contain as much of the vegetable ſpirit of the world, as ten loads of common dung, I could wiſh, that all ſuch young men-ſervants, as have no Stocks nor Trades, ſhould get them ſervices in great Innes, or to be Bayliffs of Husbandry to great men, and to reſerve all the hay ſeeds that come within their reach, and all the ſoot that is ſwept down out of the chimneys, that they can get, and once in a year to get ſo much blood at any Butchers, or Poulterers houſes as will make them into a paſte, and then to adde ſo much Cow-dung dryed to them, as being tempered with urine, will be ſufficient to make the whole maſſe apt to be formed into the form of bricks, loaves, or cheeſes, and then they are to be layd up in a dry place till they be throughly rotten, and that a ſmall quantity thereof being made into powder will not produce any thing ſuddenly, being ſpread in a garden or other open place where the rain may fall upon it, without the help of new ſeed, and then though their common dung will yeeld no price at all in that place, but rather they are forced to pay money to have it carryed away, yet this will give them a large price, after that the virtue thereof is known.

And if any ſuch men-ſervants have meanes to farm certain Acres of barren land, which lieth ſo remote from dung, that the annual rent thereof is little, then by ſetting of Wheat, or other Grain, by my directions in my book formerly mentioned, they may make one quarter, or one pounds worth of corn, to yeeld forty quarters, or forty pounds worth of corn in leſſe time than one year, and as much over and above as ſhall pay all charges and workmen nobly, and alſo as much rent as any ordinary Farmer can afford to give yearly for it, by which means he may in a few yeares get a conſiderable Stock, and be as likely to thrive as he that hath twice ſo much given him by his parents or friends: And I could wiſh all ſuch men to marry with ſuch women as by their wit, induſtry, and providence have gotten themſelves portions by my directions in this little Book; and let others which have portions given

do the like, and try concluſions whether of them thriveth better.

If ny one ſhould be ſeen to caſt away good bread, when ſo many poor people want it, then all the world would cry ſhame upon him; but why ſhould not the caſting away of any of theſe materials fondly be reputed a more heynous ſin, when as they will produce divers times their weight of as good bread as any Prince eateth.

I have ſeen by experience that Salt-peter is the moſt rich compoſt in the world to multiply Corn, and I have ſeen fifty pounds worth of Salt-peter extracted out of a vault at *Dow-gate*, not very ſpacious, which was formerly an houſe of office, and not emptied till the matter was throughly rotten, why may not the ſame thing be done by Art which was formerly done by Nature and Accident? I have been credibly informed, that ſuch a work is ordinarily done in the Kingdome of *China*, and alſo at the City of *Paris* in *France*, and I ſee no reaſon why Engliſh men ſhould not have as much wit they.

If any man hath convenient room to build two houſes of office, and to cloſe up the one whilſt he uſeth the other, then there can be no queſtion, but that inſtead of the charge of emptying, and noyſomneſs of the ſmell, he may have it emptied for nothing, and feel the ſweet ſmell of money very grateſull to moſt men, and that in as great quantity, or greater than he receiveth for his ordinary Edifices: beſides that he will ſhew himſelf to be a good member of the body politick or Common-wealth wherein he liveth; but he muſt beware, that the matter doe lye dry, and that no adventitious moyſture come to it either from beneath or above, which will be ſomewhat more chargeable in moyſt grounds, then where the earth is very dry by its own nature.

And whereas it is as clear as the Sun, that the fleſh and blood of a beaſt is five times as good as the dung of a beaſt, and that the skin, hair, wooll, horns, and hoofs are ten times as good as the dung; and that theſe things are at the leaſt the third part of the fertility and wealth of the Kingdome, and that

that theſe things are for the moſt part loſt and caſt away for want of general knowledge: I could wiſh that every Houſholder in the Kingdom would make uſe of this Book, and let it be common for all his family to read, or hear it read, to the end that ſome conſiderable quantity thereof might be preſerved, the ſoot in every ones chimney will pay him again; for a Buſhel of ſoot will produce two Buſhels of wheat, if it be well-ordered, becauſe it aboundeth much with the vegetable ſpirit of the world, by which all ſublunary things doe encreaſe and multiply.

And whereas there is much food of all kind ſpoyled for want of looking as muſty Corn, mouldy Cheeſe, ſtinking Fleſh and Fiſh; alſo if any man have any Horſes or beaſts that dye by accident, let all men be pleaſed to receive inſtructions in the ſaid book formerly mentioned, how to recover ſome conſiderable ſhare of their loſſes; and if any one cannot finde out ſome way or other to benefit himſelf more or leſſe by the reading of the ſaid book, beſides the good to the publick, let him lay the blame no where elſe but upon the weakneſs of his own underſtanding; for it will be proved againſt him that ſome have advanced their revenues above a thouſand pounds *per annum*, by ſome ſmall part of the skill contained in the ſaid book. And if every poor ſervant cannot get themſelves portions of conſiderable value, by reaſon that their Maſters houſes afford not ſtore of ſuch materials, nor ſpare room to lay them in, then let them get five ſhillings a year, that they may doe in the pooreſt houſe in the kingdom, yea the pooreſt beggars that goe from door to door, may get more than that, ſo ſhall they get themſelves every year a ſuit of cloathes, if they buy them at the ſecond hand, and ſhew their love to the Common-wealth; and perhaps ſome good minded man, ſeeing their induſtry, may diſburſe money for the accompliſhing of one crop, and take it again with intereſt, or without intereſt, out of the firſt part that is ſold, and ſo will the remainder afford them a conſiderable portion. And though that waſte paper of all ſorts, either white or brown, written or printed be not very good to make barren land fertile, yet it will

will make good Paſſeboard, the white is worth three farthings a pound, and the other an half penny a pound; to make brown Paſſeboard, good to cover Bookes, and all other things where the colour is hidden in the work, and therefore worthy to be reſerved, for in ſome houſes it is of very conſiderable value.

And let all men be pleaſed to take into ſerious conſideration, that as in every century of yeares there doe more people dye than are in the World at any one time, ſo in every century of yeares there is more Wealth loſt fondly for want of knowledge in *England*, in the compleat Art of Agriculture, then is in the Kingdome at any one time, yea though an Inventory were taken and valued at *Michaelmaſs*, when the whole yeares fruits are engroſſed together, which ſumme will double throughout the whole Kingdom (eſpecially in the Country) to the like Inventory taken at *May* day, when the yeares fruit are almoſt waſted, and little remaining but hopes, which are not uſually put into Inventories.

Whereas it will plainly appear to all rational men, that I wiſh well to all in general, let them be pleaſed to accept of one friendly advertiſement more: Chriſt ſaith, *He that is not with me, is againſt me*, admitting of no neutrality, and I ſay, that whoſoever doth not according to his abilitie, and opportunity, further this bleſſed worke, more or leſſe, liveth in a deſtructive way to the Common-wealth, or body politick, whereof he is a member, though an unworthy one.

A Letter of an experienced Husbandman, who hath also brought the Invention of setting of Corn to greater perfection, expressing his judgement upon the following Notes, Observations, Experiences and Improvements.

SIR,

YOu have often favoured and honoured me with the like favour of allowing me the perusal of many choice peices, and that particularly of Mr. Gabriel Plat's, *some printed, and some (as this) in Manuscript: All which I professe to have liked me very well, and none (that related to any the parts of Husbandry) so well as Mr.* Plat's, *but I must also confesse, that if this little piece I herewith return you (and with it abundance of hearty thanks for the reading of it) be not the best clearely of all I have seen of his yet, it at least comes nothing short of the best, some mistakes in the computations in the beginning bated. Certainly that man had as excellent a genius that way as any that ever lived in this Nation before him; and was a most faithfull seeker of his most ingratefull Countries good. I never think of the great judgement, pure zeale, and faithfull invention of that man, and withall of his strange sufferings, and manner of death, but I am struck with amazement that such a man should be suffered to fall down dead in the streets for want of food, whose studies tended to no less than the providing and preserving food for whole Nations, and that too as with much Skill and Industry, so without Pride or Arrogancie towards God or man.*

Sir, I can give you no other or better accompt, but constant praises: Onely this I say, that whereas I suppose Mr. Plat's *invention for Setting was far better than any thing that preceded; yet since it is lost, and was not so very perfect neither, as you*

know

know hath been ſince invented, the world may be ſupplyed, by this, that is, as to action, being ſatisfied by Mr. Plat's *Reaſons, Why it is neceſſary to have ſuch an expeditious way, which as it is really invented, ſo will it be (in due time) divulged. In the mean time, and ever, I reſt*

The humbleſt of your
obliged Servants,
C.D.

Certain Notes, and Obſervations concerning Setting of Corn, and the great benefit thereof.

Together with ſeveral Experiments and Improvements, imparted by Gabriel Plats *to Mr.* Hartlib.

FOur hundred graines of choſen Wheat, doe weigh three quarters of an ounce, which is three ounces for a perch; and ſo a hundred and ſixty perches muſt have four hundred and eighty ounces, which is in weight thirty pound, and in meaſure half a buſhel and two pints.

If this half buſhel being ſet upon an Acre ſhall enreaſe but an hundred for one, which is the leaſt encreaſe of ſet Corn that ever was known, then there will be about 11 quarters upon that Acre.

And that ſeveral ſorts of Wheat doe differ at leaſt 11. pound in a bnſhel in weight, and alſo in the number of grains, ſo that it is impoſſible to make this accompt abſolutely, and exactly perfect.

But yet it appeareth clear, that there is above foreſcore pounds in the two hundred pounds ſaved in the ſeed Corn in ſetting, more than by ſowing the common way; and alſo that there is above foreſcore pounds in the hundred pound ſaved in workmens wages, by this new device of ſetting: and alſo it ſhall appear, that there is above foreſcore pounds in the hundred pound ſaved in the Compoſt, by diſperſing it by my new Invention, in ſuch manner that it ſhall all lye within the attractive virtue of the ſeed Corn. Alſo

Alſo it ſhall appear, that the Corn upon every Acre, being ſet by my direction, ſhall yeeld a full third part increaſe more than if it were ſown the common way; which ſaid third part ſhall bear all the charges whatſoever, both rent and other expences; ſo that by this new way of Husbandry, there will be as much Corn gained clear upon every Acre of grond in *England*, as formerly the ſaid land did yeeld one year with another.

The ſeed wheat for the ſetting of an acre is worth half a crown, at five ſhillings a buſhel; the workmens wages for ſetting is ſix ſhillings; the compoſt coſteth little more than the ordinary charges of ſpreading the dung by the ordinary way of ploughing, *&c.*

Alſo it appeareth clear, that the gains of one Acre will do a great deal more than to pay for the ſeveral Engins; which notwithſtanding being well trimmed will endure, and be ſerviceable for the ſpace of an hundred years.

And if any man doubt of it, let him caſt up the charges of my work more punctually; and alſo the charges of the common way, and he ſhall finde that there is more cleare gains by my way by ten Acres, then by thirty done the common way, in which accompt I will not be my own carver, but will refer my ſelf to the accompt in a little book which I met withall lately, though it was printed *Anno Dom.* 1601. when ſetting of Wheat was in great practiſe; but afterwards when the price of Wheat grew cheap, and Labourers wages grew dear, the practiſe ceaſed, for want of an expeditious way.

A compariſon between Ploughing and Sowing of three Acrees of Land after the old faſhion, and Ploughing and Setting of one Acre after the manner declared in the book printed Anno Dom. 1601. *by Mr.* Maxey, *Gentleman, a great practizer in thoſe daies in the art of ſetting of Corn.*

And firſt for the charge.

The Rent of three Acrees in moſt places is worth ſome five ſhillings an acre; the land according to the uſe of the Com-

mon fields, doth lye fumer fallow the first year, and beareth Corn the other, so the Farmer payeth the yeares rent before he hath his crop, which rent cometh to thirty shillings.

The ploughing of these, if it be well done, and as most grounds require, every Acre four times, which is twelve plowings; at two shillings every time cometh to four and twenty shillings; the dunging of these three acres with some twelve or fourteen loads upon every Acre, and is for three acres some forty loads at six pence a load spread upon the land, amounteth to twenty shillings.

The seed that will sow it is usually two bushels and an half of Wheat or Rye for every acre, which is a eleven bushels and an half, at four shillings the bushel, cometh to thirty shillings.

The Weeding and Reaping, and other charges in two years, though uncertain, yet for example, ten shillings; thus two yeares rent and charges cometh to five pound fourteen shillings.

The usual encrease in the common fields, barren lands, have so little help with dung, is but two quarters upon an acre, but allow twenty bushels to stop a wranglers mouth, which is for three acres seven quarters and a half, rated at four shillings a bushel, thirty two shillings the quarter cometh to twelve pound, out of which if you take the charge aforesaid, there remaineth to the Farmer for his stock six pound six shillings; and so for every one of those acres allowing so good encrease, and so good a price, the profit two and forty shillings.

And you shall understand, that notwithstanding their accompts and mine own, of seven or eight quarters upon an Acre, and also of Sir *Hugh Plats* accompt of fifteen, twenty, five and twenty, or thirty quarters upon an acre, yet all these accompts may be true; for you may learn by my book so to fertilize your land, that it may bring thirty quarters upon an acre, in such years when the Months of *May*, *June*, and *July* prove exceeding hot and dry, which I would advise no man to trust to, in regard that these three Moneths scarce prove so once in a eleven years, in these Insulary Countries which are

subject

ſubject greatly to the change of weather; and if theſe Months prove moyſt and rainy, then all ground that is ſo mightily enriched, will be ſpoyled with rankneſs, and therefore the ſafeſt way is to order your Compoſt ſo that an Acre may bear 11. quarters one year with another.

And though I have known that an Acre of Barley hath born by accident thirty quarters, and that the ſame thirty quarters were worth the ſame year threeſcore pounds, yet the adventure was ſo dangerous, that I would adviſe no man to attempt the like.

And thus a friend of mine proceeded, *viz.* he ploughed up at *Michaelmaſs* twenty Acres of very fertile and rank green ſword ground, and afterward croſs ploughed it, and harrowed it three or four times to kill the graſs, and alſo to mingle the fat earth with the lean, then he ſowed it about the beginning of *March* with Barley before the vehement drought came had cover'd the ground ſo full, that it was as if it were even turfed with the Corn, ſo that afterwards the violent heat and drought which ſpoyled the thin and barren Corn in the Common fields did cauſe this Corn to have but a ſhort ſtraw, yet the rich earth put forth a large ear, and very exceeding thick, and alſo the corn was plump and round, which had the weather happened to be moyſt and rainy, then there would have been almoſt nothing but ſtraw, but ſo it came to paſs that he had thirty quarters upon every Acre, which was upon the twenty Acres ſix hundred quarters, and by reaſon of the failing of Corn in the Common fields he ſold it for forty ſhillings a quarter, which came to twelve hundred pounds with the rent and all, ſo that he gained above a thouſand pound clear by his twenty Acres of Barley: Yet I would wiſh no man to take in hand ſo hazardous a work again, but rather to aim at a meane in fertilizing of his land, which is the ſureſt way one year with another; for if he make his land too extream fertile, then it is ten to one he ſhall have nothing but ſtraw, and ſome light corn, which is good for little uſe, but onely for Poultry; and if on the other ſide he take ſo much areable land, that he is not able to enrich it ſo that every Acre

may bear in a reaſonable year five quarters by ſowing the common way, or thereabouts, and a eleven quarters and a half, or thereabouts, by ſetting, then let him caſt up his accompts juſtly, and he ſhall find himſelf to be no good friend to himſelf, nor yet to the Common-wealth, for he might have gained more by laying his Compoſt upon half ſo much land, and by ſetting it orderly, than by the whole, ſo that he himſelf and the Common-wealth is deprived of that benefit of the herbage of that land which he did unadviſedly and above his ability to enrich, keep in tillage to his own loſs and great damage.

Certain Experiments and Improvements for the inriching of Land, by my new Invention or Engine, which diſperſeth the Compoſt in ſuch manner, that it falleth all within the reach of the attractive virtue of the Corn.

The firſt Experiment or Improvement.

It is found by experience, that where dung hath been layd upon heaps upon fallowed land, and hath layen unſpread for a moneth or ſix weeks, and withall ſome ſtore of rain hath faln to carry down the *Chilus* or juice of the dung into the earth there, though the dung was all removed in the ſpreading from the place where the heap lay, yet there grew more corn in a yard ſquare of that ground ſo fatned with the *chilus* or juice of the dung than in three yards ſquare, where the dung was diſperſed in the reſt of the land.

By this we may obſerve that Dung doth not enrich ground till it be putrified and turned into *chilus*, or *aqua pinguis*, or *aqua viſcoſa*, and alſo that Compoſt of land whatſoever is to be turned into ſuch a nature and property before it can produce great encreaſe in the preſent crop.

Wherefore the beſt Husbandry is to prepare Earth and Compoſt in ſuch manner, that the nutritive virtue thereof may be aſſimilated into the corn and fruits in the firſt year, or elſe the Husbandman layeth out his ſtock and charges long before hand, and is deprived of great part of the benefit thereof, by reaſon that the rain and land-flouds doe carry away a great ſhare

ſhare of the *chilus* or juice of ſuch dung as falleth out of the reach of the attractive virtue of the ſeed or plant; and if any man doubt of it, let him fill all the holes (when he hath ſet an Acre of Corn) with ſuch fat earth, and he ſhall find his encreaſe doubled upon common barren field land; and contrariwiſe, let him fill the holes with common dung, and he ſhall finde no ſuch ſucceſs.

But ſome will ſay that this is a pedling buſineſs, and an endleſs work; to which I anſwer, That ſo it is indeed, to thoſe which know not the uſe of my new Invention, or Engine, but that being known, is the moſt profitableſt work in the world, for a man may fill 400. holes in the twinckling of an eye, and may order a whole Acre in like manner, with a very little charges more than the ſpreading of the dung doth uſually coſt. Therefore now I will proceed to ſhew how divers fertile earths may be prepared wherewith the holes may be filled, and ſo conſequently the encreaſe may be doubled, and this practiſe will be excellent in ſuch places where the charge of carriage coſteth much, by reaſon of the great diſtance of the place from the Compoſt; for I find, that though divers imbibitions of the ſeed with apt liquors doe produce a good improvement, yet it is not a practiſe comparable to this; for if a Farmer have twenty acres of Arable land, and have dung but for fifteen Acres, and ſhall yet have a good crop, by means of a good imbbiition, yet is not this knowledge ſufficient for a Husbandman, upon whoſe skil the happineſs of himſelf, and the whole Common-wealth dependeth: For by this way he may enrich his Arable land at pleaſure, be it never ſo barren, nor never ſo much remote from his Compoſt; for on the one ſide, if the filling of the holes be not ſufficient, he may heap them, as hops are uſually heaped, with fertile earth and dung; and on the other ſide, if the earth be too rich, ſo that it will make the Corn too rank, then he may half fill the holes, or leſs, and then fill them up with a Rake with their own proper earth, or he may make his earth ſo rich, that he may mingle with it twice the quantity of the field earth before he diſperſe it; by which means he may ſave a great deale in the charge

charge of the carriage of his Compoſt where the fields are far diſtant.

The ſecond Experiment or Improvement, wherein is ſhewed how a rich Compoſt may be made in form of earth fit to fill up the holes when the Corn is ſet.

Let an Acre, or more, or leſſe of good Areable earth, neither clay nor ſand, but indifferently well mixed, be choſen in ſome apt place, where dung is plentifull and cheap, then cover it with dung a foot thick, or thereabouts, and then you may be at choice whether you will at ſix Moneths end ſhovel off all the dung, and carry the fat earth to be uſed as in the former Experimeut, or elſe to plough it four or five times, all together in a years ſpace, and then carry all to be uſed as in the former Experiment; either of theſe waies will ſerve; for one Acre of earth thus made fertile, will make an hundred Acres fertile, and to yeeld a good crop, yea even as you deſire: ſo you may fertilize by the means preſcribed in the firſt Experiment; and this ſame work may be done in a little garden plot, in Cities, Corporations, or Villages, where a bed of good earth may be enriched at pleaſure, with all liquors thrown upon it, which contain any fatneſſe or ſaltneſſe, as urine, beef-broth, ſoapſuds, blood, brine of powdering tubs, kitchin-waſh, fiſh-water, lees of all wine, bear, perrey, cider, or whatſoever is good for hogs, the ſame will yeeld an excellent virtue to this earth. and if a cover were ſet over it to keep it dry for a years ſpace, you might enrich it ſo, that you might carry it twenty miles, and yet find more gains by it than by a common dung that lyeth but a mile off, and any Husbandman that dwelleth within a few miles of any City, make a rich benefit by bringing certain loads of Areable earth yearly into Cities, and by giving a buſhel or two of wheat to certaine Houſholders of his acquaintance, for the enriching of it as aforeſaid.

The

The third Experiment, or Improvement, where is ſhewed how a rich Compoſt may be made in form of earth, near to the Sea, which may be carried many miles.

You muſt underſtand that this Compoſt is profitable onely for ſuch ground where bay-ſalt is apt to cauſe fructification, or ſea-ſand, as in divers places in *Cornwall*, where they carry it on horſe back divers miles, and find that it maketh a very excellent Improvement: Well, thus may you work, and make as rich a Compoſt as any can be in the world for ground of that nature, Let a place be choſen where there is an Acre of kindly earth, where it may be floated at every ſpring-tide, and afterward the water dryed away by the heat of the Sun, and then ploughed and ſerved ſo many times, till it be as fertile as you pleaſe.

The like may be done by watering the earth with ſea-water, and by ploughing it with ſcoopes all ſummer, or till it be as fertile as you pleaſe; and in ſome parts of *England* the ſea water may be let into the land many miles, for the purpoſe aforeſaid. by ſcoopes

The like may be done by mingling earth with Malt duſt, Pigeons dung, or any other Compoſt, which is found to doe much good with a ſmall quantity, as Malt and other Corn ſpoyled by any accident, may be ground into Meal, and mingled with earth, or putrified with the earth, a whole yeare unground, till it be turned into earth. Alſo Lime and dung, or combuſtible earth mixed together, or all three ploughed divers times, for a year, till they be turned into earth, is a rich Compoſt.

If you can find out the true adaptation of this, and of all my other Compoſts, then you may ſave foreſcore pounds in the hundred pounds in the fertilizing of any Arable land in *England*, and alſo you may afford to carry your Compoſt to places and barren grounds far diſtant, which now admit of no improvement within charge, by reaſon of their great diſtance of place.

And if the diſtance be very far, then you may try with Bay-ſalt, Saltpeter, Soap diſſolved in hot water, or any other ſubſtance

ſubſtance which enricheth Arable land exceedingly; and when you have hit the mark, then you may bring theſe ſubſtances twenty, thirty, or forty miles, and yet you fertilize your Arable land by my new Invention cheaper than with common dung, though it were to be had within a mile of the place, if you enrich the earth with theſe Liquors or Salts diſſolved, and ſo make uſe of my Engine for the filling of the holes when the Corn is ſet.

The fourth Experiment or Improvement, wherein is ſhewed how a rich Compoſt may be made in form of earth for the purpoſe aforeſaid, which may alſo be converted into Salt-peter.

It is found by experience, that where the Salt-peter men do find an old houſe of Office in a dry vault, where no moyſture doth annoy it, there they get their beſt Liquors. Alſo it is found by experience, that Horſe-dung, being putrified, and turned into earth in a dry place, doth likewiſe yeeld much Salt-peter: Alſo it is found by good experience, that Clay walls, made of ſome kind of Clay, doe yeeld great ſtore of Salt-peter, which may be ſeen in *Oxford-ſhire* and divers other places, where Pidgeons reſort to the clay walls, and thereby give intelligence to the Salt-peter men to ſteep the ſame, who many times finde the liquors ſo rich, that they will ſteepe many pearches in length of ſuch walls, though they make up the walls again at their own charges, according to the Law.

By all theſe Experiments joyned together, it ſeemeth that a rich Compoſt either for Land, or for Salt-peter may be made as followeth.

Firſt let a little frame of an houſe about four foot high be framed in every mans backſide, as well in Cities as Countrey Towns, and let there be nothing but ſtuds, and thoſe very thin, and let it be length and bigneſs of a Sawpit, or grave, or greater, or leſſer at pleaſure.

Then build a little houſe of Office over it, which be broader than it, to keep it from rain and moyſture. Then make up the walls about a foot thick, with this compoſition of earth follow-

following, and in leſs than a eleven years, all the walls and ordure will yeeld either good ſtore of Saltpeter, or a rich earth for Compoſt worth twenty ſhillings a load at the leaſt for the fertilizing of land: If every houſhold have two of theſe houſes, he ſhall never have more trouble but to make uſe of one while the other doth ripen.

The walls muſt be made of horſe dung, and ſo much clay as will temper it, and the leſſe the better, ſo that it will hold together. The Clay muſt not be of the nature of Brewers clay, I mean ſuch as will ſtop water, of the Mawmy clay in *Oxfordſhire*, and many other places, which is partly of the nature of Marle, and will break it ſelf, which lying abroad in winter like unto Marle, or Lime, whereby it is diſcovered to contain much ſalt in its compoſition, which if it be well choſen: will wonderfully adde to the richneſſe of the earth, when it is putrified for both uſes, to wit, for Compoſt or Salt-peter at pleaſure.

If this work were well put into practiſe, the very ordure of every family might be ſo improved by my new invention, that it would produce as much Corn again as was ſpent in the ſayd houſe in the former yeares; beſides that barren land, and far diſtant from other Compoſt, might this way be made fertile.

And for the poorer ſort, whom the charge may be made conſiderable for the building of the houſes, they may lay a load or two of good earth, like a bed in a garden, and cover it from rain, and with a moveable ſtoole or ſeat make this earth as rich as the other.

But in all works where Salt-peter is expected, you muſt make a little ditch about the earth which ſhall produce it, or elſe the leaſt moyſture will draw away the Salt-peter, even as the Salt-peter men doe with their Tubs. And if any man would take in hand to build ſuch houſes of Office, in, or near to any Market-place, School Colledge, or other place where there is a great confluence of people, he might gain ſoundly by it, and alſo doe a pleaſure to the Common-wealth. And let no man doubt of this relation, for if the Compoſt be apt

Barley big steep'd in Blood

for the land and ſeed, it is marvellous to ſee the increaſe thereof: I had the laſt ſummer 18. for one upon a tryall, which I made with Beere Barly, which doe call Barly, which ſome doe call Barly big; it hath four ſquare eares, and I did nothing to it, but ſteeped in blood for one night, and then ſet it at a eleven inches depth, and ſix inches diſtance, and it yeelded more than twice as much as other Corn of the ſame kind, being not ſteeped at all in any thing, and being ſet at the ſame depth and diſtance, and in the ſame ground, on purpoſe to ſee the difference.

The fifth Experiment or Improvement, wherein is ſhewed how the difference of the nature of land may be found out, thereby to fit it with an apt Compoſt.

It is found by experience, that where vegetables dumb, as Ferne, Whinnes, Broom, and the like, have long grown, and dyed upon the ground, and have continued in this courſe of husbandry, or rather ill husbandry for many years, there the earth doth abound with the vegetable ſalt or juice, for the cure whereof it is likewiſe found by experience, that Lime, Bay-ſalt, and Aſhes, and Pidgeons dung, and ſuch like things of hot and binding nature doe poyſon it, and decreaſe the fertility. It is likewiſe found by experience, that in ſuch grounds which have been long occupied in good Husbandry, there dung is the beſt Compoſt in the world; the cauſe is, for that by long continuance in ſuch husbandry, the nature of the land is quite changed by the yearly carving of the Corn, Hay, or other crops, whereby the vegetable ſalt or juice is diminiſhed, and contrariwiſe the hot and binding nature doth predominate, which require for cure ſalt-peter, dung, blood, and ſuch things wherein the vegetable ſalt or juice predominateth: The middle of theſe natures of ground require Sheeps dung, as of all other moſt temperate, being neither ſo hot and dry as Lime, Bay-ſalt, Aſhes, or Pidgeons dung, nor ſo cold and moyſt as the dung of beaſts, in the room whereof Lime putrified with dung, or more earth, as aforeſaid, may ſupply the want thereof very exceedingly.

The

The uſe of theſe Obſervations and Experiences may teach us, that all books heretofore written for this purpoſe, are frivolous; for they preſcribe ſuch a Compoſt for ſuch an earth, of ſuch a colour, or of ſuch a mixture, as ſand clay, haſel earth, white clay, red clay, white ſand, red ſand, black ſand, &c. whereas it is found by good experience, that where Lime was the moſt excellent Compoſt in the world about a hundred yeares agoe, there about fifty yeares agoe they were forced to change their Compoſt, and to lay upon the ſame ground half Lime, and half Dung, and now the ſame ground requires the Dung onely, or elſe it will yeeld no Corn, for Lime poyſoneth it: yet is not the colour, or quality of the ſame ground in outward viſibility to the eyes corporal, but by the intellectual eyes beholden of all men of good underſtanding. Therefore that all men may obtain their deſire in this worke, my counſel is, that the more skilful men, if they take in hand to improve twenty Acres, or more, or leſſe of ſuch land, which they have not formerly tryed fully, that they goe the beſt known way with nineteen Acres the firſt year or two, and make divers ſeveral tryals in the odde Acres, till they have hit the mark punctually: And as for the more unskilfull, my counſel is, that they doe make divers ſeveral trials in the odde Acre the firſt year, and let the other be uſed as aforetime, till by experience they have learned to improve all the beſt way: By this meanes many notable Improvements may be found out of ineſtimable benefit both to the Farmer, Parſon, and Landlord, and alſo to the whole Common-wealth plenty, without any ſenſible, or conſiderable loſſe to the undertaker.

And for the better inſtruction then is contained in any book formerly printed or written of this ſubject, for the Adaptation of Compoſt, let this ſuffice for brevitie, *viz.* where the earth is ſubject in the heat of ſummer to chap much, if it be clay, or to burn much if it be ſand, there if you apply Lime, Salt, Aſhes, or Pidgeons dung, or any thing of like hot, and dry nature, there you poyſon it: Alſo where the earth is not apt to chap or burn in the heat of ſummer, there if you apply

any other thing except Lime, Salt, Aſhes, or Pidgeon dung, or other things of hot and dry nature, there you poyſon that alſo; for as it is a fooliſh thing for a Cook to put more ſalt into the pot, when the pottage were too ſalt before, ſo is it as fond a trick in Husbandry to adde a Compoſt to land wherein that quality predominateth which doth alſo predominate in the land; for Corn and Seeds are as nice in their diet and nutriment as any Lady in the world, and will not proſper nor draw the nouriſhment if it be never ſo little diſtaſtful, and this is the cauſe, why ſo many times ſo little a quantity of Compoſt doth work ſuch wonderful effects by the exquiſite adaptation to the land or ſeed.

Men might eaſily find out an apt Compoſt for ſuch land as hath been *Devonſhired*, and hath ſpent its fertility, which it will do in three years, and then it is reputed nothing worth: I aſſure my ſelf that Lime and combuſtible earth putrified together will doe the feat, yea and that with a ſmall quantity, if it be diſperſed by my Invention.

The ſixth Experiment or Improvement wherein is ſhewed how Farm-houſes, Mannors, or Towns may be builded upon high grounds, and plentifully furniſhed with water.

It is found by experience that in ſome places Townes are builded upon high grounds, where Springs or Wels are eaſily had, and there a thouſand Acres of land near to the Town are made worth a thouſand pounds in the year, and that a mile off a thouſand Acres of the ſame land for want of Improvement are not worth above a thouſand ſhillings ſo that there is loſt to the Owners and to the Common-wealth nine hundred and fifty pounds yearly.

For the prevention of which loſs let every Farmer have a Court paved like a Tennis-court, and let the Barns, Stables, and other Edifices be ſo builded that all the Rain-water that they yeeld may run into the ſaid Court, and from thence into a vault, or well, out of which it may be pumped up, or run into your kitchins, or other houſes of Office, which rain water will keep ſweet in the cloſe vault, and will ſerve for all uſes whatſoever.

This

This is commonly practiſed in *Spain*, where they have no other water throughout the whole year for all uſes, and their Gentlemen do chuſe to build upon high grounds for the benefit of the goodneſs of the air, which is more wholſome in all Countries in the Mountains than in the Vallies.

Alſo in *Venice* and *Amſterdam*, and in other places where other waters are uſually brackiſh, they keep rain water in Sellars for all uſes.

Alſo it is found by experience in *Romney* Marſhes that they uſe to gather rain water from Churches, and other Edifices, and never have ſo good and wholſom drink as when they brew with ſuch water.

And where Tarris is wanting, there you may make uſe of good clay which is of the nature of Brewers clay, and will ſtop water by laying a good thick leere thereof under your bricks, or other pavement in the bottom of your vault or well, and alſo running in a courſe of the ſame clay, betwixt the wall of the vault and the earth.

And as for water for your cattle, it is a common practiſe in the Weſt Country, to make ponds to hold water for all the year by bottoming of them with clay in this manner, *viz.* Firſt chooſe a place where ſome higher ground will yeeld water alwaies, when there is any ſtore of rain, then make your pond as great as you pleaſe, then ram the bottom a foot thick with clay, or thereabouts, then make another ſuch leere of clay, and laſtly another pavement; this being well done, it will endure for ever, and will hold water every year better than other, by reaſon of ſome fat Miſſage, which the water will let ſink.

The ſeventh Experiment, wherein is ſhewed how Sellers, that are annoyed with Water-ſprings may be remedied.

I have ſeen a Sellar made with Sheet-lead, and a floore of baords layd upon Treaſens or Joyſts of Timber, to keep the Lead from injuries in the floore, which will endure for many Ages; but this is too coſtly for Farmers; as for their help therein, I have ſeen a Sellar that ſometimes would be filled

with water a yard deep, thus cured, *viz.* First to make two little vaults with bricks layd without mortar, to each corner of the ſellar, and to vent the water into four pits, or little wels made without the ſellar, then make ſome few leſſer vaults from all places of the ſellar into thoſe firſt vaults; then ram down a good thick leere of good clay upon the top of the bricks, and then to pave the ſellar, and the weight of this clay and bricks, and pavement will preſſe down the water, and make it vent it ſelf into the four pits, or wells, which muſt be layd with bricks without mortar, and then the pits will never be fuller than the top of the Spring, but will vent away the ſuperfluous water continually, and keep the ſellar alwaies dry; but if the clay and pavement be not heavy enough to preſſe the water up into the pit, then the floor of the ſellar will riſe up, and tetter and ſwim like a bog-mire; and if it be heavy enough, then the cure is ſubſtantially performed for ever: If any moyſture come in at the ſides of the ſellar, let them be rammed with clay, as in the former Experiment for vaults. By this Experiment ſellars may be made in any low grounds whatſoever, and every one knoweth that drink kept coole in ſummer is twice as good to quench thirſt as warm drink, therefore I need not uſe more perſwaſions to men, to make uſe of this ſo cheap, ſo eaſie, and ſo certain an Experiment.

The eighth Experiment, wherein is ſhewed how the rot in Sheep may be cured.

-ot in Sheep

Although I have ſhewed in the Chapter of the Sheep how this diſeaſe may be infallibly prevented, yet in regard that ſometimes through negligence of Servants, and ſometimes through want of ſound grounds to remove them to, at ſuch times as I have preſcribed, this diſeaſe will happen in your flocks, I will ſhew a certain cure, although ſomewhat coſtly, and when I have done I will ſhew you the charge how it may be regained with great advantage: Well then, a little after *Midſummer*, if the Months of *May* and *June* have proved very moyſt and rainy (for elſe you need not to trouble your ſelves at all) then take a view of your ſheep ſomewhat ſeriouſly;

riouſly; if you find by the colour of their eyes, that they have caught that diſeaſe, then thus you muſt proceed. You muſt have a large barn or ſheep-coat, ſet about with wooden troughs, and therein feed them with Oats a day or two, then ſteal in ſome Bay-ſalt ſmall ſtamped, and after that ſome greater quantity, till ſuch time as they begin to diſtaſt it: then give them clean Oates another day or two, and afterward ſerve them with ſalt as before, and this courſe being followed untill their eyes have recovered their natural colour, then is the cure performed. This may be done in a Corrt-yard, or in another place, where an houſe cannot be had; but then you cannot ſo well recover your charges again, which muſt be done after this manner, *viz.* you muſt lay in the houſe all over good Arable earth for Wheat, and once in three or four daies let it be turned with a Spade or with a Plough, if both the ends of the houſe can be opened; and this earth when the ſheep are cured muſt be layd upon a heap for a year or thereabout, where it may be dry untill the dung be throughly rotten, and turned into earth: this earth may be diſperſed by my Engine to fill up the holes where the Wheat is new ſet, and ſo it will produce an increaſe of four times as much Wheat as you ſpent in Oates, which will pay for all your Salt and other charges.

There is a cauſe why Sheep that are folded doe rot more violently than thoſe which are not folded, though they feed upon the ſame grounds, for that they are more hungry many times by being reſtrained of their free liberty to feed at pleaſure, they doe devour the rawiſh, ſowriſh, and hurtfull graſſe with more greedineſſe, and are leſſe prone to be nice in their diet, and to refuſe that ſort which is moſt pleaſing to their nature, therefore it ſeemeth to be a good way to let them goe at liberty in the Months of *May* and *June* in ſuch yeares as thoſe Moneths of *May* and *June* prove very moyſt and rainy; for it is leſſe trouble and charge to prevent a diſeaſe than to cure it afterwards.

I have known divers men that have drenched their Sheep every year divers times, and thereby have ſaved them very well,

well, but thoſe men not knowing what years were dangerous, were more troubled than they needed; for ſometimes three or four years come together, where there is no need at all to make uſe either of cure or prevention.

The ninth Experiment, wherein is ſhewed how Corn may be preſerved in cheap years without corruption, ſo that it may ſupply the dearth when it cometh.

It is found by experience, that when three or four yeares comes together wherein Corn proſpereth well, then it becometh ſo cheap that the poor Farmer is undone: Again, if the unreaſonableneſs of the weather croſſe it a year or two, then it becometh ſo dear that the poor people are half ſtarved. To remedy this inconvenience I know no better way than to inſtruct Corn-hoarders, who though they uſually be none of the beſt Common-wealths men, yet they doe ſometimes prevent the Dearth, that it is not ſo violent as elſe it would be.

Well then, thus may we doe, make a boarded floor about a yard or two high, and as broad and as long as ye pleaſe; then ſet ledges about it, ſo that no Mice nor Rats can climb up: then in Harveſt make a Rick of Corn upon it, which may be kept three or four years without loſſe or trouble. If when Winter is paſt Corn be very cheap, then would I have all the richeſt Farmers, who are able to forbear their money, to thraſh up the moſt part of their other Corn, and to take down the foreſaid Rick, and to make it up again with a leere of thraſhed Corn, with chaffe and all together, by which meanes he may lay up a wonderfull great quantity in a little room, and have his Straw for his preſent uſe, and withall the poorer ſort of Farmers may have a better ſale for their Corn to pay their rents withall.

And as for Cities and Corporate Towns, I would have all Houſholders of good ability to keep a yeares proviſion of Corn before hand, and not to ſpend it till time of dearth, by which means the dearth will not be ſo grievous when it cometh, and alſo the cheapneſſe in time of plenty will not ſo much prejudice the poor Farmer.

And

And for the preſervation of this Bread-corn, he may lay it up in a Garner four or five foot thick, and it will keep ſweet a long time without ſtirring: If he mingle therewith ſome Flint ſtones, Pibbles, old Iron: peeces of Iron taken out of the Kiln, which never took rain ſince their burning, one buſhel of any of theſe mingled with twenty buſhels of Wheat, Rie, Maſtline, or any other Bread-corn, will keep it from heating, and if it heat not it cannot corrupt: As for Malt, it will keep two or three years upon a great heap without ſtirring or trouble if it be well dryed at the firſt: And if the price expected come not ſoon enough, it is good to change this old ſtore ſometimes, and to lay up new in the room, and never to diminiſh the ſtock till it will yeeld double price at leaſt.

I have known Barly at ſix pence the buſhel in *Northampton* Market, and at five ſhillings a buſhel in the ſame place within a year alſo: I have known Wheat at three ſhillings and ſix pence in *London*, and at fifteen ſhillings the buſhel within a year following; and Hiſtories of good credit declare greater changes than theſe in former Ages; ſo that me-thinks that it were well if Rich men when they dye were ſtrongly exhorted and perſwaded to give ſome number of quarters of Corn to be preſerved for the publick ſtore againſt ſuch miſerable times of dearth and famine.

A friend of mine propounded to the City of *London* to ſhew them a way how they might keep a thouſand quarters of Corn in ſuch a floor where now they can keep a hundred, by mingling Corn with great Beans, exceeding hard dryed on a kiln, which may be ſeparated eaſily with a wire Trie, and are as profitable as the Wheat, and that they ſhould be eaſed of the charges of turning Corn in the ſtore-houſes.

This Gentleman had learned the experience by long traveling into far Countries, who when the City were not forward to gratifie him for his paines and good will, told me how it was to be done, which here I will divulge for the benefit of poſterity.

In hot Countries the uſe is in ſome places to put Corn in Vaults to keep it cool from putrifaction: but this is not found

to be a good experiment for these cold Countries. In *Egypt* I have credibly heard, that the Store-houses which *Joseph* erected had no covers; but how it was so long preserved I cannot learn nor conceive, unless those Countries being hot and dry, having no rain at all, doe ripen the Corn so well, and free it from moysture, that it is not apt to putrifie, though it lye *sub dio*, which seemed to be possibie, for that Malt well dryed will keep two or three years without stirring; and also Corn in *Russia* (where for want of maturation, they are forced to dry it in stoves) which will keep a long time: but howsoever it is certain, that these former directions being observed in *England*, the extream cheapnesse in time of plenty may be remedyed whereby poor Farmers may not be so greatly damnified, and also the extream dearnesse in time of scarcity may be mitigated, whereby the poor buyers of Corn supply the rest, which I wish may be practised with all possible diligence, especially in time of dearth, which will save such a wonderful quantity of Corn for present relief, as all the Store-houses in any Kingdom could never preserve the like in all Ages heretofore.

It is found by experience, that when there is but a little Corn too much to sell in a Market, there the price falleth too extreamly: Also if there be never so little a quantity too small to serve, then the price is enhanced too much in all conscience: For the remedy of which two inconveniences, being so great, all courses seem to be taken, which may possibly be devised.

The tenth Experiment, Wherein is shewed the natural cause why the changing of Seed corn produceth an improvement; also certain wayes for the melioration of Seeds and Fruits.

It is found by experience, that if Seed-wheat be brought from barren, and stony land, and sown upon rich clay ground, it prospereth wonderfully, the cause is double: First the Corn that groweth upon a barren land, is more plump and full than that which groweth upon very rich land, and therefore hath more

more force to encreaſe. Secondly, the Corn that growth upon ſtony land hath attracted plentifully the *Juter*, or petrifying ſaltiſh nature, which falling into another earth, where that ſubſtance is wanting, ſtandeth in ſtead not onely of ſeed, but alſo of compoſt.

The like might be ſhewed in many other works of this kind, but I wiſh that this may ſerve to give light to the reſt: As for the meliorating of Seeds and Fruits, the former experience ſheweth the way; for there is in every compounded ſubſtance in the world a double kind of fatneſs or ſulphur, the one is apt to putrifie the other, not ſo apt, but endureth longer without putrifaction: this may be ſeen in Cabbages, and other Garden fruits, growing near great Cities where dung is plentiful, which if they be boyled in water, and the water kept a little time, it will ſtink ſooner than that wherein the like ſtuffe hath been boyled which growed in grounds more barren.

Whereby it appeareth that the extream fatting of ground with dung doth in ſome ſort adulterate the ſeeds and fruits, and *piſorate* their quality, and contrariwiſe the ſowing the ſame in more barren earth, doth meliorate the quality of the ſame.

Therefore the beſt way is to ſow, ſet, or plant ſeeds in barren land, for ſeeds onely; for by that meane; they will get a greater melioration in their quality when they are intended for ſeed than the *poſoration* can be in the ſowing them in earth much enriched with dung; for in all rich dunged earth the attractive virtue of the ſeed draweth much of the fatneſs, which is not much putrified, whereby it declineth from its former virtue and goodneſſe. The one of theſe fatneſſes is gratefull to humane nature, the other is offenſive for the avoyding of which inconvenience I know none better than to let the dung be fully putrified, and turned into earth without ſtnking, before it be mingled with the Corn or Seeds.

And this may be done by my former Inventions, in ſuch ſort that there may be above foreſcore pounds in the hundred ſa-

ved in the Compoſt of all the Arable land in *England*. There are three cauſes why people in the Country live longer, and have better health than thoſe that live in great Cities: The firſt is, the aire is more pure and wholſome: The ſecond is their food doth not abound ſo much with the fatneſs and ſulphur, which is apt to putrifaction, and to contaminate the blood: The third is their much exerciſe doth evacuate that part of their nutriment which is ungrateful to humane nature.

The contrary to all theſe is in great Cities, where the aire, dyet, and exerciſe are ſo much different, the effect doth ſhew the cauſe very clear, ſo that there need no other or further philoſophation concerning the ſame.

If any man doubt whether vegetables draw the corruptible or ſtinking ſulphur, or fatneſs which lyeth within the reach of their attractive virtue, let him behold the places, where beaſts have lately dunged in Paſtures, and he ſhall finde that there the graſſe is more ſowre and giſtaſtfull to the Beaſts and Cattle.

The eleventh Experiment, wherein is ſhewed how rich Compoſt may be made in great Cities of things formerly caſt away.

The water wherein Fiſhmongers water their Fiſh, being made as ſalt as it will bear with the foul ſalt in the ſweeping of ſhips, ſalt Lime, great Larders, and other ſuch places, being boyled in Butchers ſlaughter-houſes when their beaſts are to be killed, and the blood let run warm unto it, being likewiſe hot, it will not clodder, but will be admirable good liquor to imbibe good Wheat earth, whereby it may be made the richeſt Compoſt in the world to fill the holes where Wheat or Barley is ſet, for that one buſhel of this earth is ſufficient to be mingled with three or four buſhels of the earth of the land it ſelf, by which means great charge is ſaved in the carriage it ſelfe, by reaſon that a little quantity will work a great effect. Saltpeter for ſome grounds is more apt and cheaper, though the price be greater; for a little quantity will work

a great effect, especially where the land is hot and dry by nature.

Saw-dust is excellent to mingle with earth to fill the holes where Corn is set in strong binding clay ground. Also shavings of horn, hoofs of all beasts, hair of beasts, woollen rags chapped small are admirable. Shavings of horn are now usually sold in *London* for three shillings and six pence a sack for the same purpose: also woollen rags for two shillings a sack: As for hoofs of beasts, hair, and Tanners horns, may be putrified in good Arable wheat earth, being kept dry from rain, and then the earth, and all together is the richest Compost in the world to be used for the filling of the holes where Wheat is set: Also all other composts whatsoever mentioned in this book are the most wholsomest for mans body, and most effectual for producing of great encrease if they be thus ordered.

The twelfth Experiment, Wherein is shewed how any Kingdom may live in great prosperity with half the trouble and charge which now they sustain, and yet live in adversity.

It is found by experience, that where there is a good Council of War, there the kingdom is well defended; and where there is good regularity in Divinity, there the soul is preserved from sickness: Why should it not be so for the state temporal, if a council of Husbandry was erected whereupon the happiness of all kingdoms doth depend? Surely if a certain number of the best experienced men were deputed for this purpose, who might regulate the rest, it would produce a great perfection in that knowledge, which as it is the most ancient of all Sciences, so it is the most excellent and honourable, for that by it all Princes live, and no Inferiour person can possibly live without it.

The Plebeans are like those in *Ireland* who will not lay aside their old custom, to draw their horses by the tayls, though an Act be made against it, nor lay aside the burning their Corn in the straw to save the labour of thrashing, though their houses lye unthatched. I have known some Parsons in Parishes which have been skilful in Agriculture, and have been

excellent Improvers of land, and ſome that were good phyſitians, and have done much good in their Country that way. I have alſo known ſome Landlords qualified with the ſame skils, and certainly if all were ſo, it would conduce greatly to the proſperity of a Kingdome, for the greateſt profit would redound to thoſe two ſorts of men, yet may the matter be eaſily ordered ſo that the reſt might live in twice as much proſperity as now they do, and though they were doubled in number: for I have known many men to live better with 30. acres of land than others have done with an hundred of acres; and if need require I can ſhew where one acre of land hath been worth two hundred pound *per an.* by being planted with Mellons, and a whole family have lived well upon it, and gathered riches. If the courſe of Husbandry were regulated in this manner, *viz.* That no man ſhould occupy any land in Paſture whoſe fertility may perpetually be encreaſed by the means of water, though the hay growing thereupon were totally ſpent, to produce dung for the fertilizing of high grounds: Alſo that no man ſhould occupy any land in Tillage, whoſe fertility may be perpetually increaſed in Paſture by having the ſame dung ſpent upon them which they yeeld naturally: Alſo that no man ſhould Till any other land but ſuch high and barren land as is not able to fertilize it ſelfe, and ſhould make uſe of my ſeveral Inventions for the enriching of the ſame. Then would there be left but little barren land in *England* in a ſhort ſpace, whereby all the premiſes in this twelfth Experiment might be eaſily performed.

A friend of mine did ſearch divers Regiſter books in ſeveral Pariſhes in *England*, he alſo ſearched the Parſons bookes of Tythes, and found that where Arable land as turned into Paſture there were fewer Chriſtnings, and many more tyth Lambs and tyth Calves, whereby he diſcovered a kinde of Witchcraft, which is to turn men into beaſts. To diſſolve this Witchcraft there is no other way, but to goe the contrary way; and whereas the Landlord found more gain in the increaſing of ſheep and beaſts than formerly he found in the increaſing of people, to ſhew a way how more gain may accrew

crew to the Landlord by the increaſe of people than formerly he found in the increaſe of beaſts; and ſurely this is no hard task; for if the peoples employments be well regulated, there will come more profit a great deal than by beaſts. And if there be any doubt whether people may be had to improve the land, and to produce greater profit than beaſts can doe, let but things be ſo ordered that the Plebeans may have ſuch good employments whereby they may maintain a married eſtate plentifully, and it will be found by a ſhort experience, there will be no want of ſervants. By this means the Parſons may double their tyths, the Landlord may double his rents, and the common people, though doubled in number, may live twice as well as they did before, and Princes and Stateſmen ſhall not have half the trouble which they had before; for want and neceſſity is found to produce grudgings and diſcontentments: Theſe have produced Rebellions and Inſurrections, all which have cauſed Princes for to loſe their kingdoms many times, and turned the ſtate of Countries topſey turvey. Beſides that the lives of men would be lengthened, as in former Ages by their good and wholſom diet; for there can be no other cauſe in nature, why men ſhould be now of leſſer ſtature, and enjoy worſe health, and dye ſooner than in former Ages; but theſe few, *viz.* Firſt men are much imployed with worldly cares and difficulty for living in populous Countries, which might eaſily be remedied by the means aforeſaid. Secondly, the Corn (which ſhould be the preſerver of other meats from too ſudden corruption in the bodies of men, before the *chilus* hath performed all his ſeveral offices) is now adulterated and contaminated much by mixing the dung with the corn before the corruptible part thereof be conſumed, and ſo the corn helped to contaminate the blood which ſhould preſerve it, and would do it powerfully, if my new Invention were generally put into practiſe. Thirdly, in populous Countries where there is difficulty of living, the pure law of nature is not obſerved in Marriages and married eſtates, but other reſpects doth ſway overmuch, which cauſeth defects in many generations. But to return to my main ſubject, I am now about

bout a way to experiment, to meliorate any Corn, Pulſe, Seed, Kernel, Fruit, *&c.* and doubt not but to bring it to paſſe in ſuch ſort that the pleaſantneſs of the taſt, the wholſomneſs of the ſmel, and the ability to keep other meats from ſudden corruption in mans body, will invite great men in general to make uſe of the ſame, and to give good prices, ſo that a Farmer may maintain his family well, and grow rich too by the planting of 1 Acre of land yearly: For upon my certain knowledge, there are fondly caſt away in every family in *England*, as well in great Cities, as Country-towns, ſo many things as being uſed according to my direction, would produce ſuch an increaſe of corn yearly as would ſerve for the maintenance of the ſaid family, and would be more wholſom for the body of man than the greater part of corn which now uſually groweth in *England*, yea though this Compoſt ſhould be uſed in the more barren ſort of land: So that now the queſtion is not whether this Land, and ſo conſequently other Kingdoms may live in worldly happineſs and proſperity for ever hereafter, but whether they will do ſo or not; for if they be willing, they wil ſhew the ſame by their actions, and then I am ſure there is no doubt to be made of the poſſibility thereof: Whereby an *Utopia* may be had really, without any fiction at all.

If order were given that every Over-ſeer of the poor in their Pariſhes, only one day in the year in the practiſe of ſome of theſe new Inventions, as ſetting of Wheat, of compounding of Compoſts in great Cities, fit to be carried many miles, then they would be expert againſt a year of dearth and famine, ſo that they might be employed in that work, whereby a wonderfull quantity of corn might be ſaved for the preſent relief of the Land, which elſe muſt needs be imported from other Kingdomes, for which the wealth of this Land muſt needs be exhauſted.

The thirteenth Experiment, wherein is ſhewed how timber for buildings, and wood for houſhold-ſtuffe may be provided in ſhort ſpace.

It is found by experience, that a Cheſnut will grow in ten or

or twelve yeares into a fair tree, able to be the Maſter-poſt of a fair building, and then there is no queſtion but that it may be provided into leſſer parts, for ſtudds and ſpars. It is alſo found that a Walnut will grow in the like time into a tree able to make little tables, boxes, ſtools and cheſts, very beautiful and fit for uſe to adorn the houſe.

Whereby any younger brother that will ſhew ſo much frugality and providence as to obtain leave of his father to plant a certain number of ſuch trees in ſome convenient place in his fathers lands in his minority while he is a School-boy, he may not onely have wood to build him an houſe, and to furniſh it againſt his occaſion, but alſo he may win ſo much credit by his indnſtry and diligence, that as for my part, if I had a daughter to marry, I would ſooner match her with him, though I purchaſe him land to ſet his houſe upon, than with his elder brother if he wanted thoſe gifts and qualities, though he were able to make a good Joynture.

For I have ſeen by experience, that a preſent eſtate, either real or perſonal, is not to be compared to the quality of thriving, which any man elſe may likewiſe ſee by experience, that ſometimes, yea many times, a Farmer being induſtrious, intelligent, and provident, though he pay a good round rent, liveth better than a Freeholder which is owner of much freeland.

The fourteenth Experiment, wherein is ſhewed divers waies concerning Fruit-trees.

It is found by experience, that if the kernel of a Pear or Apple be ſet and not grafted, but be let grow to a great tree, then it will not bear fruit till forty or fifty yeares, as a great number of other trees of the ſame kind.

It is likewiſe found by experience, that a Sien taken from a tree that is fruitfull, and alſo from the moſt fruitful bough of that tree, and being grafted into a young ſtock of the ſame kind, as that before mentioned, will bear fruit in a quarter of the time which the other did, the cauſe can be no other but that nature hath ordained a certain time for propagation in all things, but yet the ſaid time was accelerated in the graffed

tree, by Art helping Nature, but in the other tree time was left to natures free determination.

So that every one may make choice of these two wayes at pleasure; and if he aim at his present profit, then graffing is his present way and best; but if he aim at the profit of his posterity, then it is best not to graft at all.

And by this means he may change the tasts of fruits at pleasure, which by graffing he cannot doe; for it is found by experience, that if three kernels of several sorts be put into the cave of a Bean-stalk cut half an inch long above a knot, and so set it will bear a fruit contrary in colour, tast, and form, contrary to any one of them: Also by this means he may exalt the nature and excellencie thereof at pleasure, if about the root thereof he make three or four little holes in the earth, and now and then with a little Fennel and a spoon he put into the holes a little of the best new wort, wherein hath been boiled a little Cinamon, Cloves, Mace, Sugar, or any other substance of excellent tast and odour.

For as it is found by experience, that any evil neutriment doth spoil, yea & sometimes poison the thing nourished, so any excellent nutriment doth wonderfully advance the goodnesse and excellency thereof. And after that these trees are come to age of maturity to be fruitful; then the Siens taken thence will be perpetual, and able to fill the whole Country with fruits of the same kind, and by such means as these there is no question but all these varieties of excellent fruits were obtained in former times; for it cannot be thought but that at the first, when there was none but wild fruits, there could neither be such varieties, nor yet fruits of such excellency.

I have now some tryals in hand with some pulse, fruits, and garden stuffe to meliorate them in this manner, and doe not doubt of the succes.

The fifteenth Observation and Experiment, shewing how it may be ordered that Corn shall never be exceeding cheap to the great prejudice of the Farmer, nor exceeding dear to the grievance of the buyer.

It is found by experience that when Barley is at two shillings the

the buſhel, or under, then an Acre, and ſo twenty A cres of land may be manured with Malt more cheap than with dung, if it be worth ſix pence a load, and to be carried half a mile, and this is true if after the common manner the Malt be ſowed amongſt the Wheat, as they uſe to doe with Pidgeons dung: Malt duſt, rags, ſhavings of horn, ſalt-peter, bay-ſalt, or any other thing which is potent and effectual for multiplication. Now let every man judge of how great conſequence this Experiment will be, if by my new Invention the Malt be diſperſed into the holes where the Wheat is ſet, ſo that it all lye within the attractive virtue of the Corn, for then none will be loſt, and by this means an acre of land may be manured with ſo much Corn as is uſually caſt away by the accuſtomed manner of ſowing more than by ſetting.

And the reaſon why Malt is ſo much better than Corn, is becauſe that by drying upon the kiln the vegetative ſpirit is killed, and by the Malting the nutritive virtue is opened and advanced, and it mattereth not of what Corn the Malt is made, as of Barly, Peaſe, Beans, Oats, Fetches, or Buck-wheat, or whatſoever is cheapeſt; for by this means it is converted into the ſubſtance of the Wheat together with the benefit of the multiplication, neither is it material whether the Malt be ground or not, eſpecially for Wheat, or any Corn ſown before winter, for that in due time it will be diſſolved and putrified, ſo that by little and little it may be aſſimilated.

I have found by experience, that when I have taken the great piked Wheat, my increaſe hath been doubled more than with the ſmaller ſort, the reaſon can be no other, but that ſuch Wheat is both Seed and Compoſt. I have alſo put into every hole with the Wheat ſeven or eight Malt-cornes, and then increaſe was four or five, yea ſixe times more increaſed than before, and this ſeven or eight Malt-corns being ſo diſperſed by my Engine into every hole is quickly done, and amounteth to no more Corn than is uſually caſt away in ſowing more than is needful in ſetting.

Now the uſe to be made of this Experience for the prevention of cheapneſſe, is to make a great uſe thereof in time of

Sowing Corn as manure in cheap years & using dung in dear ones —

exceeding plenty, and to keep much dung in ſtore for another year; this with the practiſe of ingroſſing and hoarding up of Corn, taught before, will prevent immoderate cheapneſs, and preſerve many an honeſt poor Farmer from poverty.

And howſoever I ſhall not be free from the aſperſion of the ignorant Plebeans for this my attempt, yet I regard them not, being devoted to the univerſal benefit of all, and let them be pleaſed to underſtand that every cheap year is but a forerunner of a dear one, unleſs that this courſe be taken, by reaſon that much Corn ground is uſually upon ſuch occaſions turned into Paſture, when as the Farmers find more gain in converting the fruits of the earth into Beef, Mutton, Butter, Cheeſe, *&c.* then by turning them into Corn.

And let them be pleaſed alſo to take notice of the Statute made in the reign of King *James* of happy memory, which alloweth Engroſſers to hoard up Corn for no other purpoſe but this, which Statute I wiſh all men, that can ſpare their money, to take notice, and to maſte uſe of the ſame for their own advantage, as wel as for the publick benefit, and let them not doubt of their gain, which muſt needs prove certain howſoever, yea though nature ſhould divers years together prove a loving Nurſe, and not play the Step-mother by adminiſtring too much rain or too much drought, or too little of either, which is ſometimes ſeen three or four years together, though very ſeldom, and if it happen ſo, yet by turning the Arable land into Graſſe, it hath alwaies come to paſſe, as I have diligently obſerved for many years, that the price of Corn hath been doubled at the leaſt.

Now that I have done with the preventions of cheapneſſe, I will proceed to the preventions of dearth, which may be partly done by the ſtoring of Corn, and partly by my new Invention for the expeditious ſetting of Corn, which is ſo eaſie and quick for diſpatch, that he that hath an ordinary plowland, *viz.* ſixty acres in Tillage may ſet it all in due time, and pay his charges with the fourth part of the money, which he may ſell his corn for preſently, beſides the increaſe of the ſucceeding crop, which wil be a third part more at leaſt, and will come in a good time; for it is never ſeen, that corn is very cheap, the next year after a dear.

And

And by this meanes a good Farmer may ſow twenty quarters in his ſeed corn, which is worth twice as much mony as it is other yeares, and how much corn will be thus ſowed in the whole kingdom, I lean to the eſtimation of all men, and ſuppoſe that they will confeſs that if every Farmer keep theſe Engines ready for ſuch times, howſoever they make not ſo great uſe thereof in time of exceeding cheapneſs, that it may well be called ſtore-corn, and is more effectual, and preſerveth greater abundance of Corn for the prevention of dearth, then all the ſtore-houſes that ever were in the world.

I have taken the more pains and diligence in the penning of this diſcourſe, becauſe I beheld the mercileſs dealing of men one with another upon all advantages; for if corn proſper well, then the buyers will cauſe the price to fall twice as much as much as the plenty requireth in equity; and on the other ſide if Corn do fail never ſo little extraordinary, then the ſellers will inhaunce the price double at the leaſt to that which a good conſcience requireth.

The ſixteenth Experiment, ſhewing how all ſublunary ſubſtances may be changed one into any another.

This Experiment may ſerve as well for pleaſure to a man, that delighteth in the knowledge of the ſecrets of nature, as for profit to him that delighteth in the gaining of riches, and if any man that delighteth in both, ſhall take advantage by theſe my demonſtrations to obtain his deſires, it ſhall not diſpleaſe me. When I firſt entered into theſe ſpeculations, I conceived that ſurely the God of Nature had endued her with a great deſire of changes, even as he endued the inferiour creatures with a deſire of propagation; for elſe certainly in ſome age or other there would have been more ſtability in ſublunary things than hath ever been found; for what changes hath their been in Monarchies, Lierchies, Kingdoms, Commonwealths, great Families, Honours, Governments, Religions, &c, ſurely a man cannot but think that Nature taketh great delectation to ring changes upon the bels of Fortune, and alſo in the change of one creature into another, ſo to make varieties at pleaſure.

× What sort of Government is this?

To proceed according to my accuſtomed brevity, becauſe I wil not increaſe my book to a greater volume, then I intended: I will tefer the Reader to the peruſal of my former Experiments, which doe in a manner containe all together ſuch changes, and here I wil onely handle ſome few of the moſt difficult and ſuch as are by moſt men deemed unpoſſible. And my firſt demonſtration ſhall be to ſhew how Minerals may be turned into vegetables; the ſecond, how vegetables may be turned into Minerals; the third, how animals may be turned into vegetables back again; the fourth, how thoſe vegetables may be turned into Minerals.

And in theſe tranſmutations, I mean not that the whole ſubſtance is changed, but that a ſhare thereof: ſo much as is apt for the next body, into which it is to be turned, is really changed, even as a man ſhould take a great viol, or inſtrument of Muſick, and make a little Fiddle thereof, no man can deny, but that the ſubſtance of the Viol is converted into the Fiddle, notwithſtanding that there is a great number of chips which entered not into the Fiddle

Well then I will proceed, and devide this ſixteenth Experiment into ſeveral Experiments for more eaſie apprehenſion.

The firſt Experiment, ſhewing how Minerals may be turned into vegetables.

Firſt chooſe a parcel of Arable land that is ſomwhat barren, and divide it into two equal parts, water often the one half thereof, with water wherein the oar of Copper hath been long ſteeped therein, and putrified till it be greeniſh and fattiſh; the like may be done with water wherein Engliſh Coperas hath been diſſolved, which is made of iron; then water the other half with common water as often; then ſow all the land with the ſame ſeed, and look how much more cometh of the one than of the other, the ſame was produced by the vegetative part of the Minerals.

The ſecond Experiment, ſhewing how this Corn may be turned into Animals.

Take a couple of tame of Pidgeons, and let them have no other

other Corn but this, and let them breed and multiply in number, and then the increaſe muſt needs come from the vegetables which had their increaſe from the Minerals.

And if you will proceed further, you may work theſe two Experiments in ſuch great quantity, that there may be Corn and Pidgeons, and other fowle enough to ſerve a man and a woman without any other food till they have increaſed their number, and then you have part of the ſaid ſubſtance converted into reaſonable creatures, which are the moſt excellent amongſt all Animals.

The third Experiment, ſhewing how this Animal may be turned into Vegetable again.

Take a parcel of barren ground, as before, and bury an Animal in it, then take two trees both of one growth, and greatneſſe, and plant one upon the grave, the other in the ſame barren ground, and you ſhall ſee that the tree growing upon the grave will be greater than the other, for that it is nouriſhed with the putrified Animal, and ſo the ſubſtance of the Animal is turned into the Vegetable.

The fourth Experiment, ſhewing how this Vegetable may be turned back into Minerals.

This wood being put into ſome particular waters will be turned into ſtone; the like may be done in ſome Mines and Quarries, I have ſeen both Wood and Fiſhes turned into Stones, and no man can deny but that ſtones are Minerals, and if this be done in very fit water, Mine or Quarrie, then the Stones may be melted into Iron or other fuſible ſubſtances, and if Iron you may turn part thereof into good Gold by the way preſcribed in my book of Minerals.

And thus you ſee how this wonder is nothing, the ſecret being diſcovered, and that I doe as it were carry Owles to *Athens* in the publiſhing thereof: the like may be done by turning Graines into Malt again when they have been brewed, by diſperſing them into holes where Barley is ſet, ſo that they will produce as much Barley, which being turned

ed into Malt, will make as much drinke as before.

And ſo may any barren land be turned into fertile land, and if any man doubt it, he may ſee a fruitful garden made upon the top of a Turret or Rock though more pleaſant than profitable, and therefore the Impoſſibility being taken away, let every one trouble himſelf no further but to find out where it may be done with the greateſt facility, for it will quit the charge the better to improve grounds near *London*, where hay is at thirty ſhillings a load in a cheap year than in the Country, where it is at ſix ſhillings and eight pence a load, though the labour and charge be alike.

There is an old ſaying, that it is better to buy good land than make good land, which is true with this diſtinction, *viz.* It is better for him that is ignorant in Husbandry to buy good land, but for him that is skilful, it is better to buy barren land, ſo that it lye apt for Improvement, for that by this means he may gain as good a revenue for a thouſand pound charge and purchaſe as another ſhall gain for two thouſand pound; and I fear not that this diſcovery will leave no means for men of skil to thrive more than others; for I am aſſured there would needs to be but little barren land in *England* but through the barrenneſs of mens wits.

The laſt Experiment, ſhewing how weeping land may be drained where there is no level.

Make a ditch about it, then ram the ditch full of tough clay to keep out rain-water, then make a pond in the nether part of it, into which make drains under the ground, as is taught in the Experiment; then raiſe the water by an engine or water-work of the moſt fit ſort for that place and purpoſe. This work will quit the charge very well near *London*, or in any place where hay and graſſe is at a good price.

A Philoſophical Letter concerning Vegetation or the Cauſes of Fruitfulneſs.

I Shall a little tell you what my thoughts are about Vegetation, and what I have within my ſelf inſtituted.

Firſt, I have framed a pretty large Induction upon common and familiar Experiments, to demonſtrate that without controverſie Salt is the ſeat of life and vegetation, and ſo the ſubject of nutrition. And this being aſſented to, it is in the next place to be conſidered whether Salt as Salt be this ſubject, or whether all Salts equally nouriſh? Here comes in an examination of Salt by their Tribes, as 1. Nitrous Salt, 2. Urinous Salt, in which are comprehended, 3. all Dungs, Horns, Shreads and the like; 4. Common Salt, and Sea ſand; 5. Kaly Salt, as Aſhes, Kelpes, Mineral Salts, as of Stones or Lime, of Marl, Chalk, Fullers-earth, Vitriol.

And becauſe ſome Salts doe kill, as that of Vitriol, alſo that of Stones and Lime, if applyed in quantity and to the plant it ſelf immediately. Hence comes the examination of Salts further, *viz.* Whether any Salt doth univerſally nouriſh all Plants, and make them thrive, or whether ſome doe beſt agree with one, others with another; and upon the clear determination of this, and this ſolely doth the great ſecret of Imbibition depend, if we ſpeak of things rationally, and not like Mountebanks. But here two knots offer themſelves, and will do ſo whether we will or no.

Firſt ſeeing you cannot ſow, ſet, or plant any Vegetable or Seed in ſalt alone, but muſt require two other *Media*, viz. Water to diſſolve and make fluyd the particles of Salt, whereby the pores of the Plant or Seed may be capable of it, and admit it. 2. Earth as a fit *uterus* or *matrix* to keep the thing planted ſteady. Hence a ſcruple ariſeth, what is earth abſtra-

ctedly considered, for either it is and or salt, or water, or some other body. If Sand, whence comes its clammineſs and aptneſs to sod together? If Salt, whether is that a peculiar salt, and whether can it be separated or not from it? If Water, how comes it to be unable to nouriſh without addition ſtil of moyſture. If earth be none of all theſe, what is it, and what is its property, and whether hath it any Energy? And indeed this is a very neceſſary enquiry; for my Imbibitions ſignifie nothing if my earth be beforehand impregnated with another ſalt of perhaps a much different nature than what my plant imbibed doth require: And how ſhall I know this, when all Inquiries about the natures of earth, their ſeveral ſalts, diſpoſitions, their uſes, and neceſſity for Germination, and their ſeveral wayes of compoſition and correction is wholly lame and unſought after.

5. It is to be conſidered, that Water, eſpecially Rain-water, hath life in it ſelf without any addition of Salt or Earth, as is moſt apparent as by many Experiments, ſo by that famous and commonly known one in *Africks*, That Rain-water in four and twenty hours will ba full of Inſects, that it will putrifie. Now if even Rain-water it ſelf be ſufficient for life, and do contain manifeſtly a vital ſalt in it, what is the need of thoſe other Salts which ſeem more remote from a life or vitality of diſpoſition.

6. As no poſſibility of nouriſhment, nor any approach to Vegetation without moyſture, ſo no poſſibility of life without an excitation and production of it by an actual warmth, and this is as well ſeen in vegetables as in Animals: For the earth is there, the ſalt is there, and the water is there, yet in ſharp and cold weather vegetation is not to be effected. Hence on the other ſide produceth nothing ſimply unleſſe in a ſoyl firſt fitted, and cold it ſelf, though not a fit ſeaſon for Germination, yet permits of nutrition to many plants, who have even their luſtre then, as the Cypreſs, the Firre, the Bay, with ſeveral other. He therefore that will enter upon this great ſubject of promoting Vegetation, muſt firſt know what things are *prin ipalia*, what *minus principalia, tamen neceſſaria*, and what part

part to attribute to each, viz. the Earth the Salt, the Water, or Dew the warmth and the ſpirit of the Plant it ſelf.

Secondly, he muſt ſeriouſly weigh, whether the ſubject of Fermentation and things that ſerve to excite and entertain heat be not of one kind, ſubject of nutrition of another.

Thirdly, whether Fermentation being no other than a *ſpecies* of Motion, there may not be divers ſorts of it ariſing from the nature and diverſity of the Salts or other ſubjects which cauſe it: And whether according to this divers motion the ſubject of Nutrition, having in it alſo a vitall principle, may not be diſpoſed more or leſſe, to take this or that figure?

Laſtly, he muſt reſolve the ſeveral Caſualties, as I may call them, of Vegetation, as why the earth puts forth ſome Plants *ſponte*, not other? why it very ſeldom puts forth ſome, unleſs it be in producing of others, as *Botanists* can tell you, that many Plants are rarely, or never found unleſs in ploughed fields, either under Corn and Tillage, or under Fallow, why water ſhould put forth Plants that will not at all grow in the earth? Why on the other ſide ſome plants deſtroy even the Vegetative virtue, as it were in the ſoyl where they are, as to many Plants, as is manifeſt in Hemp and in Oade. Theſe, Sir, are the Inſtitutes I ſet my ſelf to in the point of Husbandry. In the ignorance of any of which, I think a man knows ſatisfactorily very little. They are rudely ſet down, but may afford ground of larger diſcourſes. If you ſhall pleaſe either to cheeriſh or excite this humour in me, by laying or propounding of ſomething further for promoting of vegetation upon theſe comprehenſive grounds, I ſhall not refuſe to deal very freely with you, if you will afford me an occaſion by letting me have the thoughts of ſome better wits than mine own upon them.

An Extract out of another Philosophical Letter.

IF I were to answer the question concerning fertility, I would in one word say, that the chief cause of the opening of the of Seed, and its becoming fruitful, is the *Anima* or *Sal Natura*, and that which is its Deputy or Load-stone: and I think that this saying will comprehend all those causes which the Proposer of this Question doth very learnedly reckon up. For hence (though it be more then the Husbandmen know) comes all the ploughing and turning of the clods upside down, that so fresh earth like an hungry Loadstone, may be exposed to the light, by which it may draw in that *Sal Natura*, which doth make it fruitful. All dungings are the Deputies and Loadstones of this *Sal Natura*, and by them, ground may be recovered, amended and imreproved.

Another Letter on the same Subject.

I Have read the Book of Husbandry thorow, being very much delighted with the many profitable ingenious and promising Inventions specified therein, I wishing that I were a Farmer in the Couutry, to play the practical Philosopher. I remember in *Cambridge*, being a youth, I was wont to maintain that he was no Natural Philosopher, that could not advance his Tillage, order his cattel, fishing, fowling affairs with more dexterity, and to greater profit then another man that pretends no skill in Physick. This I speak from what I have read somewhere in *Ramus*, who referred all Arts to profitable use in mans life, abhoring the vain ostentations of the sophisticated Universities. The mention which

which is made of Experiments of fructification by Salt, confirmes me in an opinion, that the Sea is as the heart of the World, whence the waters run by low and ſecret waies into the earth, as by Arteries carrying the vitality of Salt into the body of the whole earth, wherewith it hath loſt its mettal and vigour, and is become freſh, it returnes again by the Rivers as by veins into the Sea, to receive a new fructifying and quickning tincture, by the way ſerving to allay the indiſpoſitions that Animals finde in themſelves by the overactivity of Salt, which we call quenching of thirſt, *&c.* I have long thought of this, being moved thereunto at firſt by conſidering the like motion of blood in the Microcoſme, as here the heart reſembles the Sea, the motion of the blood the ebbing and flowing and circular motion of the Sea waters: for the blood being ſalted in the heart, and ſpirited with ſubtle Nitre or Gunpowder, it by the Arteries in a more ſecret paſſage (like that of the Sea waters into the earth) is diſtributed through the body, where having ſpent its vigour and metal, it by the high and viſible way of the veins, lying on the ſurface of our earth, is returned to the heart again to be freſh pickled, I doubted of the truth of this, till I read your book, becauſe I remembred that I had read of ſowing the ground with ſalt in the Iſraelitiſh wars, which I had heard interpreted to make it barren, and becauſe I have heard the old women ſay, it will make hearbs dye to have urine to fall upon them.

How the Controverſie about Helmont's *Aſſertions, mentioned in the fourth Deficiencie of the Legacy of Husbandry may be reconciled.*

IN your Legacy (*Deficiencie* 4.) I finde theſe words, *A learned Author* (Helmot) *ſaith that ſmuttineſs of Corn, which maketh it ſmell like a red herring, was not known in* France *till about* 1530. *At which time the great foul diſ-*

eaſe

ease began to break forth, which he conceiveth from hence to have some original, as also the Camp-disease.

To this your friend at *Paris*, in his letter dated *July* 22. 1651. replies thus.

The foul disease had its original full 36 *years sooner than* Helmot *saies* (viz.) *in the year* 1494. *and nothing could be advanced more absurd or ridiculous in the judgement of all sound Physicians than to attribute the original of that disease in any wise to smutty Corn, as he doth.*

This difference had been prevented, if both your friends had not written without book. The place in *Helmonts* writings, is not quoted by the former man, nor doth the latter seem to have looked for it. You shall finde the passage in *Helmonts* book called *Tumulus pestis*, in the fourth chapter, whose title is, *Peregrina lues nova*, there you may finde these words, *Notatur autem annus* 1424 *& Parthenoplicobsidio, ætas luis, ejusque prima nativitas.* Here the Printer was negligent, as appears by that which follows a great way after in the same chapter. *Lues* (saith he) *ista primùm visa legitur in obsidione Neapolis, Anno* 1494. Then follows a long discourse wherein he seems to approve the opinion of one that suspected that it was bred by some villain that at the siege of *Naples* buggered a *Mare* (for that *Helmont* means by *jumentum*, imitating the French word *jument* infested with the *farcin*, or, as our Farriers call it, *the fashions* And, saith he, *Non credam facilè unquam* [*antea*] *ejusmodi peccatum in talibus terminis ab origine mundi commissum; estq; morbus* [*ille, Farcin*] *lui venereæ similis & equinæ naturæ affinis ac familiaris.*---- After this *Helmont* proceeds in the order of time.

Anno 1540. *sub Paulo III. circa Autumnum in Apulia prope Tarentum, prima apparuit Tarantula---- Araneæ simile, &c.*

Anno 1550. *in Augusto, Galli primum viderunt Triticum, quod vocant roratum, sive mellitum: in aristæ adhuc viridi halecem sumptam odore reperiens in matura verò nihil nisi fetidum pulverem atrum: pestilentiam utinam non morborum plurium c.*

Anno

Anno 1556. *noſtris oris maritimis* (he means *Flanders*, *Zealand*, *Holland*) *primum apparuit ſcorbutum*, *veteribus ignotum*.------

By all which, it is manifeſt, that *Helmont* hath written nothing contrary to your latter friends aſſertions; and that your former friend in writing that paſſage, truſted more to his memory, than it deſerved.

An Obſervation touching planting of Trees in the Fenns.

I Received your Legacy of Husbandry, (though do not yet ſuppoſe you dead) but rather your own Executor diſtributing your good things in your life time, whileſt others are like Swine, good for nothing untill dead. I have peruſed the book, and cannot but wonder, that in your conſtant reſidence in *London*, you can ſee ſo far into the Country. One part I have pitched on, and that is the Plantation of a Mulberry Garden, for the feeding of Silk-worms, and having ſome already, I ſhall indeavour their increaſe as much as may be. I hope *S. R. Weſton*, will comply with your deſires, and alſo all others whoſe abilities ſhall be accompanied with good affections, and a will for to promote all uſefull arts and ſciences. Touching Planting of Trees being lately in the Fens about *Whittleſey*, I obſerved a kind of Husbandry, of planting of Willows by ſets upon ridges, which in thoſe vaſt and vacant grounds being alwaies very moiſt doth ſoon produce an incredible profit, and increaſe of fire-wood and Timber for many Country uſes. and doth improve as faſt as your Lime-trees. As I meet with other things, I ſhal acquaint you with them.

Mori

More Observations concerning Fruit-trees, and the great benefit of Furzes, for keeping Mice and Rats out of Barn-floors (or other rooms), as likewise Reeks of Corn, and Cheese-racks.

I Had not untill now, conveniency to give you a further accompt of the *Sussex* Gentleman improving of his fruit-trees, my friend will repair unto him and take as he promiseth the particulars from himself, and I may then impart it more satisfyingly: yet at the present he relateth that he gathereth all the Sult that remaineth in the Channel that conveigheth water to his Meadows, and layeth it on heaps in or near his Orchard, and then taking all earth he may conveniently from his fruit trees root, he putteth this Sult unto them, and this every two years, and that he hath thus recovered old decaying Trees, and such as had scarce bark or any life left in them, and that his other Trees have shot forth and fructified double and treble to what they did before. For the *Devonshire* Gent. I am hopelesse of seeing him again, but his relation concerning Furzes, was to this effect. That they valued them much in *Devon*, and sowed their seed for hedges to shelter their Cattel, and for Fuel and that they found them very profitable for fruit-trees being young, to hang about their bodies neer the ground to defend them from Hares (which usually bawk young Trees) sheep and winds; and that the (*dressis*) as he called the dust of them, doth marvelously hearten the earth in which they grow if laid upon the ground onely round about them, and that they value that dust for that use above any horse dung. They are of excellent use to keep Mice out of Barn-floors, for being laied under the Corn, Mice and Rats avoid touching the floors. So Reeks of Corn, that stand from the ground upon

on piles of Wood and Cheese-racks that have Furzes bound in the way where the vermin might creep, are sufficiently secured. The Lady *D.* told me that at *Islington* being annoied with Rats, she was advised to take Furzes, and place them in the passages and holes where Rats entred her rooms, and that she was fully cleared of them by that means. Thus contemptible things are of precious use, by the order of him, that made nothing in vain.

An Estimate made some years ago, of the great destruction of Corn by the multitude of Pidgeon-houses.

An Estimate of the great quantity of Corn that Pidgeons do eat spoil and destroy in the County of Cambridg, *and* probata *for every shire of* England *the one with the other, as by due inquiry may be made appear as followeth,* viz.

1. THat there are in the County of *Cambridge* 163 Parishes, and in every Parish one with another 3 Dove-houses, every house hath in it at least one with another 200 holes, which are bred in, and in every hole a pair of Pidgeons, which breed, besides those that have no mates, which breed not, of whose number no notice is taken, which devour, eat, and spoil much Corn also.

2. That it hath and may be proved that a Pidgeon hath had at one time in her Crop, 1000 Wheat Corns, which is about a pint, a Pidgeon doth feed thrice a day, then conceive what every Pidgeon doth spoil, eat, and devour in a year, but to come to a far lesse scantling, that a Pidgeon doth eat but half a pint a day, besides that he spoileth, by the space

of ſix weeks in the harveſt time onely, beſides that he beateth much down and ſpoil, in beating down the ſtanding Corn that amounteth unto at leaſt at the rates aforeſaid, for every Pidgeon houſe the one with the other 39 Combs, and 6 pecks one ſort of Corn & grain with another, the which tother at 10 s. the Comb, comes unto 19 l. 13 s. 9 d. but let it be granted (as true it is) that every Pidgeon houſe eateth, beſides that he otherwiſe ſpoileth, to the value of 20 l. worth by the ſpace of ſix weeks as aforeſaid, and the number of Pariſhes in the whole Nation, being 9533. as *Wites* Almanack ſaid, beſides *London*, and ſo rate every ſhire with the County of *Cambridge*, at 3 Dove-houſes for every Pariſh, the one with the other; for in ſome Pariſhes there be farre more, at which rate the whole Kingdom amounteth unto 28599. devouring Dove-houſes, the which at the ſeveral rates aforeſaid commeth unto 571980 *l.* damage to the whole Kingdom, in ſix weeks ſpace onely, but it is conceived they haue nine weeks in the harveſt to eat and ſpoil, in which it may amount to half as much more; beſides that they devour at ſeeds, and other times in their ſeveral waies.

3. That the multitude of Dove-houſes are winked at, and are ſuffered to ſtand in many places for the ingendring of *Peter*, where ſome of the Owners thereof not ſowing any Corn at all, and ſome other having but a little Land with Corn of their own inheritance. And moreover, the profit of any Dove houſe, is not worth to the Owner thereof, the 40. part of that which the Pidgeons devour onely in ſix weeks ſpace, beſides what they beat out and ſpoil.

4. That the damage then in what the Pidgeons eat, devour, and ſpoil in the whole Kingdom in ſix weeks ſpace, at the rates aforeſaid, amounteth unto One Million, ſeven hundred, and ſeventeen thouſand nine hundred and forty pound at the leaſt.

5. But if it may be proved, that they eat and devour by the ſpace of nine weeks as aforeſaid, then it will amount to the ſum of Two Millions, five hundred, ſeventy three thouſand, nine hundred and ten pounds damage to the Kingdom

in

in that ſpace, which is more than all the Pidgeons and Peter made in the Kingdom is forty times worth.

6. That if it may be computed how many poor people of ſix perſons in a Family at a buſhel a week for every family, that which the Pidgeons doe eat and deſtroy in the ſpace aforeſaid will maintain ſo many thouſand families for nine weeks ſpace, which is a thing worthy to be thought upon and reformed by the Parliament.

7. That in ſome Towns where there are not above fifty or ſixty Families, there are ten or twelve Dove-houſes, and the beſt owners thereof except Lords of the Mannors, have not above forty or threeſcore acres of ploughed land in the Town; beſides that, it will be proved, that in ſome Pariſhes there are two or three Dove-houſes, where is not one Acre of ploughed land in theſe Pariſhes.

8. That Judge *Crook* at an Aſſize time was of opinion, that it was neither fitting nor lawfull for any man to have a Dove-houſe when ſo many poor people and their families may be maintained with the Corn that the Doves doe eat, ſpoyl, and devour.

Another Eſtimate by way of confirmation of deſtructive Pidgeon-houſes.

PIdgeons can fly farre for the filling of their crops and return the ſame night, ſo long as Pidgeons can get Corn they will eat little leſſe

They begin to eat Corn about the end of *July*, at which time the Corn (which is before hand ſprung up in the ear, and that ear pretty well filled) begins to ripen or turn colour, and they hardly want Corn till the end of Barly ſeeding, which is about *May* day, which in all amounts to two hundred and eighty daies or thereabouts, the reſt of the time they live on benting, *&c.*

There are in *England* and *Wales* at leaſt 24000 Dove-

houſes, and there cannot be leſſe than 500 pair of old Pidgeons in each houſe one with the other, which amounts to 2000000 of pairs.

(To ſpeak very modeſtly) each pair of old Pidgeons (with what they carry home to their young in their ſeaſons) do eat one pint a day, which is in a year for every pair above four buſhels, and for all above 6000000 of Quarters of all ſorts, worth one with the other twenty ſhillings a Quarter. Thus much they devour certain, out of what we have and know; but if we ſhould goe about to reckon what might have come of thoſe corns they eat at ſeed time (being doubtleſſe the beſt and largeſt grains of all, and more like to come to good than thoſe they leave) which cannot be accompted leſſe than 4000000, ſince ſeed time is twice as long as harveſt, and ſhould we ſuppoſe but one ear to have come of one grain, and that ear one grain with another to have yeelded but ſixteen ſingle corns, it would ſeem ſtrange to hear talk of 64000000 of Quarters (and conſequently of pounds as aforeſaid) to be prevented thus yearly, that it may ſeem we might have, but have not, by our own wilfull preſerving and multiplying ſo great an enemy in our very boſoms; beſides the incredible hurt they doe yearly in unthatching, and ſo ſpoyling of whole ricks, and beating out and down many thouſand acres at harveſt.

A kind of Univerſal Medicine, or the virtues of Chewed Bread.

GOD is very often pleaſed to manifeſt his great power by ſuch means as are in themſelves, or at leaſt we eſteem them for ſuch, the moſt common, weak, unlikely, or contemptible. And of this ſort is that kind of Medecine I told you of, which I have very often experimented for curing my ſelf and others of divers and ſeveral wounds, aches, bruiſed ulcers, and other hurt and ſorances, for confirmation of

of this truth give me leave to report unto you some particular experiments which I my self have made from my own self.

I was once (passing the Irish Seas in a vessel that was ballast with coale, and by a violent storm, and a great leak almost suffering shipwrack, my body being made much more lyable to receive the malignant quality of a damp, or infectious vapour arising from the wet coal by being first much sea-sick, and immediately fasting about four daies and five nights) taken with a great swelling, and that fallen, and nothing to be seen, there followed the greatest torment by way of ach, that (I thank God) I ever felt to this day; which pain (notwithstanding many salves and medicines, prescribed by some that pretended much skill, lasted, nay encreased for at least three weeks space. At last I resolved, and did lay to this easie Poultesse (*viz.*) White Bread Chewed in my own mouth to a kinde of pap or soft paste: I chewed so much as bound both my feet about of all sides; I went to bed, and fell fast asleep for two or three houres (which I had not done in all the time before.) The next morning when I waked, my pain was gone: And (I thank God) I was never troubled with it since.

Another time being struck with a (new shod) ston'd horse, just on the shin-bone, my legge swel'd so that my boot was fain to be cut off: I layd this to it when I went to bed, and next day the pain was gone, yet to this day there is the mark.

Divers green wounds I have cured with it.

My hand was bitten through by a mad dog, I layd this only to it, and healed it in three or four daies.

I have by applying this six times so mollified a Corn upon my toe, that I after took it out core and root and all, and never any more grew in the place.

I took once a very great cold, which swel'd all my throat on both sides under the chin, and broke into a foul *forance* like the Kings Evill. I applyed this, and took it away in two or three dayes.

For many years together I was troubled with an old pain in my ſhoulder, cauſed by ſome ſtrein the pain was not alwaies but onely when I did ſuddenly and violently lift up my arm as to ſtrike or through a ſtone or the like, by applying this I took it away.

And laſtly ſince you commanded me to give you this accompt, as I was with a great hook pruning a tree in my Orchard, I ſtruck the point of it by mischance into the nail of my Thumb, above a quarter of an inch almoſt through, and in two or three renuings of this ſalve, God be praiſed) 'tis very well.

And leaſt it ſhould be ſaid or conceived that this Medicine would cure none but my ſelf, I have alſo experimented it upon divers others; for example, Once I applied it to a mans leg that was ſo ſwelled and putrified, that he had divers great and deep holes therein, and all over nothing but moſt filthy rottenneſſe, it was conceived to be a Gangrean howſoever under God this cured it.

Once I applied it to my ſervant, that was run into the very joynt of the knee with a ruſty Rapier, and for want of looking to it, did feſter exceedingly; inſomuch that the Chyrurgians ſpoke of cutting it off, howſoever under God it did cure him, although he did come at his wife in the time of the cure.

Once a Maid of my Siſters received a very violent blow with the handle of a double draw well, it was black and blew (as they call it) from the Elbow to the Shoulder, for it hit her upon the Brawn of the Arm, yet under God, I cured her in a day or two with this onely.

My wife had the end of her Thumb ſorely bruiſed or broken, between the Wheel and the Nut of my Engine, as it was in ſwift and ſtrong motion, and applying nothing but this, ſhe was well in a ſmall time (God be praiſed.)

Cum multis aliis.

The quality of it is (ſlowly but certainly) to ſtench blood, to eaſe pain, to draw out any poiſon or a thorn, and to heal up and make ſound the place grieved.

But

But ſome men by intemperance, or evil conſtitution of body, are harder to heal then others.

If you lay it to any ſound place it works nothing. This I teſtifie for truth upon my own knowledge.

C. D.

The Scotch way of Brewing their ſtrongeſt and beſt ALE.

1. THey firſt boil the water, and ſcum it till it be very clear, and then

2. They put that water to the Malt, allowing eight gallons of water to every buſhel of Malt, which done:

3. They ſtir it very wel for the ſpace of one whole hour together, at the end of which:

4. They cover it very cloſe with cloaths, and let it ſtand ſo for two hours; and then:

5. They let the Wort run out from the Malt.

6. When the Wort is all run out, they boil it for two whole hours together, and take of the ſcum very clean; which being done:

7. They put it into Coolers, and when it is well cooled it will rope like oyl, and then:

8. They put it into a Tub, and put their yeſt to it, but if they want yeſt they take a green Birchen rod, and wreath it, and ſo put it into the Wort, and it will make it work as well as yeſt will; having done ſo:

9. They let it work very well before they Tun it, and afterwards when it hath done working in the veſſel, they ſtop it very cloſe with ſalt and clay, and ſo ordered it will laſt ſeven yeers; but becauſe with long ſtanding it doth waſt, they in the heat of Summer, do fill it up with new ale, which will both make it work, and quicken it.

How

How to make Wine out of Corn.

TAke your Alewort as it is fit to barrel up, put it into a veſſel that will contain about twice as much, and into it put of good Honey deſpumed to every Gallon of Ale a pound and a half. and of good Yeſt as much as will ſerve to ſet it on work. Cover then the bung (not cloſe) and the veſſel lay over with clothes, and once a day for about a quarter of an hour ſtir it well, and be ſure you ſtir all the Honey and Yeſt well, when you put it in, ſo it will work well for ſeveral daies together; and when it hath done working almoſt, renew the working with new Yeſt, quickned with a ſmall quantity of fine (*i.e.*) the fine flour that is in grinding Malt) Malt duſt, this doe three times, and at laſt before the working be quite over ſtop the bung, leaving onely a quill hole for about two dayes, then ſtop it cloſe, and let it ſtand coole in a cellar; in two Months, it takes the natural taſte and ſmel of Wine, and will keep accordingly.

Another Proceſſe to make Wine of Corn.

TAke good Malt ground, as it is to be brewed, put to it as much water as the veſſel will hold, when it is full of Malt; adde Yeſt to it equally in every part, and let it work what it will in a barrel the bung open. Then take to each Gallon of the matter half a pound of good Honey, diſſolve it in warm water, and put it in warm, and more Yeſt: Let it the ſecond time work with not a fourth of the vent it had at firſt; and when the working is almoſt abated, take half as much Honey more, and diſſolve it and warm it, and let

let it work by putting in Yeſt the third time, onely a peg-hole open, and when this third Fermentation ceaſeth, let it ſtand open ſix houres, to let out the wild ſpirit, then ſtop it up cloſe, and in four Months it will be clear and fine, which then is to be racked from the Lees, for all but the husk of the grain will be liquor, and this Wine is not inferiour in taſte and goodneſſe to the richeſt Canaries.

Becauſe it is hard to hit right upon the knack at firſt, and few proceſſes of this nature perfectly underſtood without a few tryals, it's adviſed, that theſe Experiments be made in many and little veſſels (for that's much the ſafer way) till we are Maſters of the Mechanick of them.

Some Animadverſions upon the foregoing Proceſs of making Wine of Corn.

I See no defect in this Proceſſe, if by thrice fermenting the taſt of the hony will be taken away. It is no matter what quantities of Water and Yeſt you uſe, provided there be Yeſt enough to make it work, which every Brewer knowes, and experience will eaſily ſhew it: And for your Water, you may take as much as will make it either ſtrong or ſmall, as you deſire it; for the quantity of water will no way ſpoyle the buſineſſe. But I am not of their mind who think it may beſt be brewed in ſmall veſſels, for they are not fit for the purpoſe. For my part I would never try it in a leſſe veſſel than a barrel, for experience ſhews that drink will work beſt in great veſſels. *Glauber* knows how to precipitate Raiſins and Honey ſo as to take away the taſt of them, and to make the liquor taſt like Wine, but I could never get it from him; yet I gueſſe he doth it with Tartar, or Lees of Wine.

Glauberus's *Promiſe or Undertaking for making Wine out of Corn.*

OUr friend *Glauber* is deſirous once again to draw unto us, he is at preſent with his family at *Franckfort*, being minded to come down again into *Holland*, deſiring my advice herein, and to hold ſome diſcourſe with me, being alſo to come with the firſt opportunity in his own perſon to the Elector of *Colen*. He doth fully apprehend, that it can no longer faile him, but that he ſhall obtain in a ſhort ſpace of time a good ſumme of money for the ſupport of his family, in regard he hath a great and weighty peece of buſineſſe in hand, which proceedeth out of Corn, and is affirmed to have ſuch a property, that it will be acceptable to the whole world, ſo as thereby a quarter of Corn ſhall be advanced to a great value. He is intended ſhortly to put forth a ſmall Treatiſe, being an Explication upon his *Miraculum mundi*, wherein he will endeavour to reveal ſome of the chiefeſt matters therein contained to thoſe that deſire it, and to demonſtrate it to their ſight. And he doubts not but that many great Lords and Princes will ſtrive accordingly to bring profit and advantage to their countries as being a work of great importance. Now the reaſon why he will communicate is this, becauſe that it is endeavoured after already by falſe pretenders, and that much miſchief may eaſily be effected by it, neither can it much longer be kept ſecret, together with the Communication of the Corn and Wine Traffique.

He will make Wine out of Corn, which in all reſpects ſhall be anſwerable unto the natural wine. He hath likewiſe ſuch a compendious way of melting the Sun and Moon, Earth or Mines, which will be neceſſary and acceptable unto the whole world, whereby he is in hope not only to raiſe a good ſumme of money, but alſo to procure an immortal fame to his poſterity, for they are unheard of things, profitable and neceſſary

ceſſary for the whole world to know. Theſe are all his own *formalia* dated the 6th. of *October* at *Franck-fort*. The aforeſaid Treatiſe ſhall ſpeedily be tranſlated into Latine, whereby it may be tranſported into forraign parts.

An Advertiſement concerning the Myſtery of making Wine according to Glaubers *undertaking.*

ALL ingenious and induſtrious experiments that deſire further ſatisfaction in this matter, till *Glauber* ſhal have performed his promiſes, relating to his Corn-wine undertakings, are faithfully adviſed to ſtudy and practiſe the ſeveral hints and directions, which are given in a Treatiſe, called *The Reformed Commonwealth of Bees.* Printed in the yeer 1655. and is to be ſold by *Giles Calvert* at the Black Spread-Eagle at the Weſt end of *Pauls.*

How a Meadow about the end of May *or beginning of* June, *before the Seeds of Graſſe are ripe, may be uſed.*

LEt Weeders (hired by the day) cut off the heads of all ſorts of Graſſe, but ſuch as of which the ſeed is deſired. This being done, the Meadow will be ready to cut before the graſſe that hath loſt its head can put forth new, and by this means the hay of this Meadow, being threſhed at time of the year, before it be foddered out, will both be ſweeter to the Cattel, and yeeld onely the ſeed that is deſired.

How much Ground in England *may be cured, that through the predominance of some quality in excesse, will not sward again, or gather a good head of grass, for the first, 3,4,5,6, or 7 years, when laid down after Ploughing.*

THe exact cure is too tedious here to set down since it may be occasioned by the sterility, and that must first be helped by soyl or the like; but for one general cure you shall only procure hay-seeds, which did grow on ground of the like kind but richer, as upland to upland, lowland to lowland, &c. and therewith sow your ground, hot furrough and in a fit season in the full moon in *January* or *February*, the more Winter you lay it down, and suffer nothing to bite them all about the end of *August* after, and in the mean time roll it often and seasonably, and then mow it, and your cost shall be neer repayd, and the ground restored.

A Letter of a very ingenious Gentleman, Mr. R. H. *concerning the Husbandry of Clover-grass.*

SIR,

I Have not been insensible of the obligation which a former promise laid upon me, which was to give you an account of the proceed and profit which I made of a small quantity of ground by Clover grasse, which I could not compleat much sooner, in regard that it is not long since I sold the last of my seed, so that unlesse I should have set a suppository value, upon part of it, I could not draw the

the account to a perfect head till then; for every thing--*tantum valet quantum vendi potest*,--- and prizes of all commodities ebbe and flow. I will not injure this Husbandry so much, as to have you think that it can receive a true character from my experiment, for I must not be ashamed to own many errors committed therein, which were the effects of my general unskilfulnesse in Georgick, and was not easie to be prevented where there were no practical guides extant, nor any vestigia's thereof to be found, but what were tracked and discovered by the book thereof, first pnblished by you, and you well know the difficulty of putting Theory well in practice. I have heard of some in *England* that have made almost an incredible profit of it, much more then I have been sensible of, but yet I find the improvement so considerable, that I am much incouraged to proceed in it; the particulars are as followeth. The ground I planted contained little above two acres, I sowed 15 pound of seed upon an acre, the charge I was at all manner of waies was five pound, which was more then repaid by that Summers crop of Barley. The next year the 28. of *May*, I mowed the Clover, there was two loads upon it, for which I refused five pounds. The next crop I let stand for seed, which was ripe in *August* following when I cut it, and had three very great loads, which I reckon at nine pound, as that yeer went, I had 300 *l.* of seed some of which I sold for 16 *d.* the pound, some more, the whole profit of that year I cast to be 30 *l.* besides the after pasture. This last year in regard of the great and unusual unseasonableuesse of it, doth not equal the former profit, but take it at the worst as far as I have gone it is a great improvement, and though you were not the parent of this husbandry, yet you were the hand that did obstetricate and gave it birth which else had been strangled in a private hand, and the publick never known this benefit, for which it is your debtor, and as a limb thereof,

Your Friend and Servant,
R. H.

Another Letter ſhewing the great benefit ariſing by Clover-graſs to the Commonwealth in general.

Worthy Sir,

UPon Mr. *Crutendens* narrative to me of the wonderfull ſucceſſe God gave him in the Clover-graſs which he ſowed, I deſired him for your incouragement in ſuch publick indeavours to give me under his hand, a gratefull teſtimony thereof unto you, from whoſe love and pains he took his directions, which he as readily did, as I do here willingly tender it unto you. The Gentlemans eminent piety and good husbandry are ſo well known in *Kent* near *Tunbridge*, that they command beleef; and I think there are none that obſerve him in both or either, but they become his imitators or enviers. For mine own part from what he affirms and alſo many others in the family agreeing therein with him, and from what I ſaw with my own eyes, I am perſwaded that the extraordinary improvement of Land by the uſe of the ſaid Seed, is ſo very incouraging to the general uſe of it that through Gods bleſſing within a few years, the land or ground belonging to this Commonwealth will maintain double the number of Cattle then now it doth, to your great profit in particular, if the Nation were thankfull, and to the inriching of the Commonwealth in general, by the tranſportation of quick ware into forraign parts though now prohibited. The which bleſſing of God upon your unwearied labours in this kind, and upon the induſtry of the Husbandman eſpecially, upon the labours of the ſpiritual Vinedreſſers the Godly Miniſters of *England* that ſo the inhabitants thereof may have

have plenty here and glory hereafter, he moſt heartily prays, who is

Sir,

June 2, 1652. *Your very loving friend and humble Servant,*

T. U.

Mr. Crutendens *Letter and Certificate.*

Noble Sir,

UNderſtanding by Mr. *Underhil*, that you were deſirous to ſpeak with me (I was much taken with it) that Providence ſhould ſo much favour my wiſhed deſires: I have received direction from you concerning your own Obſervations, for this Husbandry in *Brabant*, and the adjacent parts, for which I have as truly as I could, ingeniouſly obſerved, and paſt by the practiſe of the Dutch-men, (which are in the County of *Kent*) wherein they differ very much from you, yet with much thankfulneſſe, I am able (by the mercies of God) to give you as profitable an account as any Dutch-man in *England* (that hath varied from your rule) that as yet, I ever heard of. The particulars I will give you an account of, whenſoever you pleaſe to command me to wait on you, which is cordially deſired by him, which hath trod ſome ſteps of your inſtructions, and gratefully reſteth your ſervant to be commanded.

The Certificate, Iune, 2. 1652.

I ſowed 4 acres, on which I ſowed 40 *l.* of ſeed according to your directions, the Lord did ſend me from it 20 Buſhels of Seed, and 12 loads of hay at twice mowing; the firſt crop I mowed was the 19 day of *May* laſt, and do find that one load of Clover hay, is worth two loads of the beſt of our other

other hay, and for the after paſture it was three times better then any ground I had; I am ſure to ſpeak within compaſſe, my four Acres did yeeld me in one year, which was the laſt year fourſcore pound.

Hen. Cruttenden.

A Letter from Upton 11 April, 1653. *Concerning the Husbandry of Clover-ſeed.*

SIR,

UNtill now I could not be ſo throughly informed (by the party that writes the incloſed) what he hath found (in his ſeveral ways of practiſe) to be the beſt way and time for ſowing this Clover-graſs ſeed, and how, and where I might be furniſht with the beſt and beſt cheap, which hath retarded this my thankfull anſwer to your kind Letter, Mr. *W.* ſhewed me ſome that he ſowed laſt year thin, amongſt other good Engliſh hay duſt, upon bare rubbiſh earth (in *Northampton*, where he had demoliſhed ſome of the Bulwarks:) Which now is throughly covered and hath a full freſh bite of very rich green ſward thus early; but I find the Clover-graſſe ſeed would have Corn thicker, but that the other Engliſh ordinary hay-duſt (being as he thinks more natural for our climate) doth choke the other, wherein I differ in opinion with him; for it's apparently higher and ranker, and over-ſpreads the other much. This Clover-ſeed was of his own growing, in a little piece of ground in his Orchard very good, which he mowed twice the laſt year, *viz.* about *Midſummer*, and about a fortnight after St. *James* that being ſowed on the 6*th*. of *April* laſt before, and yet he did not cut it untill it afforded ſeed both cuttings, and he beleeves the laſt cutting afforded rather more and better then the firſt, and that little (ſowed of it ſelf) is long enough (but that it is not ripe enough) to be mowed now. He beleeves the ſeed

ſeed that is of his own, that comes of the Dutch ſeed, is altogether as good if not better then the Dutch ſeed, Mr. *R.* ſowed ſome Dutch ſeed laſt yeer there, ſome in his garden, and about an acre or two with barley, upon a red ſandy ground in his cloſe by his garden, that was worn out of heart with bearing too many crops of Corn, and I viewed them both laſt week, and I found that ſowed in his Garden to be throughly ſwarded, and was (as they told me) mowed the laſt year, and is now again in as forward a condition as Mr. *W.* ſowed in his Garden: But that ſowed with Barley is ſcarce ſo forward, as Mr. *W.* ſowed with ordinary hay ſeed as aforeſaid, and it comes not much thicker, and is in greater danger to be eaten out with Scutch graſs, that ſuch kind of ground (worn out of heart:) is apt to breed, ſo that upon conſideration of the whole matter, I think the beſt way for me would be to ſow it alone without Barley, in the beginning of this moneth, which cannot now be done this year, unleſſe I had been provided of ſeed earlier; beſides Mr. *W.* ſaith it will be hard to get good ſeed ſo late, eſpecially new ſeed which is beſt to be had at *Candlemas*, and much cheaper then now, for he ſaith (when he was at *London*, which was a little before I was with you) new ſeed was riſen from 8 *d.* the pound to 1 *s.* and before he came out of Town dearer; but when new was at 1 *s.* they offered him old ſeed for 6 *d.* and he is confident it may be had at half the price of new at any time. I ſend you in Mr. *W*'s. Letter, ſome of the beſt kind of new ſeed, by which ſample (if you be not skild) you may know old from new.

Sir Richard Weſtons *more ſpecial directions for the beſt ordering of Clover-graſſe.*

CLover-graſs Seed thrives beſt when you ſow it in the worſt and barrenneſt ground. Such as our worſt heath ground is in *England.*

The ground is thus to be prepared for the Seed.

Firſt pare off the heath; then make the paring into little hils; you may put to one hill as much paring as comes off from a Rod or Pole of ground, which is the ſquare of ſixteen feet and a half.

The hils being ſufficiently made and prepared (as they doe in *Devonſhiring* as we call it) are to be fir'd and burnt into aſhes. And unto the aſhes of every hill you muſt put a peck of unſlaked Lime; the Lime is to be covered over with the aſhes, and ſo to ſtand till rain comes and ſlakes the Lime. After that mingle your aſhes and lime together, and ſo ſpread it over your land.

This done; either againſt, or ſhortly after rain, plough and ſow; ploughing not above four inches deep and not in furrows, but as plain as you can, and to make yet plainer, harrow afterwards, and with buſhes under your harrows.

The ground being thus prepar'd you may ſow your ſeeds. An Acre of ground will take about ten pounds of your Clover graſſe-ſeed, which is in meaſure ſomewhat more than half a peck. The chief ſeaſons of ſowing it are *April* or the latter end of *March.*

About the firſt of *June* it will be ready to be cut. It yeelds moſt excellent hay. The time of cutting it will be more exactly known, by obſerving when it begins to knot: For that is the time: And ere the year be done, it will yeeld you three of thoſe crops, all of them very good hay; and after you have thus cut it the third time, you may then feed the ground

ground with Cattel, all the Winter as you do other ground.

But if you intend to preſerve Seed, then muſt you expect but two crops that year, and you muſt cut the firſt according to the foreſaid directions. But the ſecond growth muſt be let ſtand, till the Seed of it be come to a full and dead ripeneſſe, and then muſt you cut it, and threſh the tops, and ſo preſerve the Seed, you ſhall have at the leaſt five buſhels of Seed from every Acre.

This Seed thus threſhed off, there will be left long ſtalks, theſe your Cattel will eat; but when they grow old and hard you are to boil thoſe ſtalks, and make a maſh of them, and it will be very nouriſhing, either for hogs or any thing that will eat thereof.

After the ſecond cutting for ſeed, you muſt cut it that year no more; but as it ſprings again, feed it with Cattel. One Acre of it will feed you as many Cows, as ſix ordinary Acres, and you will find your Milk much richer; which induces ſome not to cut it at all, but onely to graze it for their Dayry.

Being once ſowed, it will laſt five years, and then being ploughed, it will yeeld three or four years together, rich crops of Wheat, and after that a crop of Oats.

And as the Oats begin to come up, then ſow it with the Clover-ſeed (which is in it ſelf excellent Manure) for that you need not beſtow any new dreſſing upon the ground, and by that time you have cut your Oats, you will find a delicate graſſe grown up underneath, upon which if you pleaſe, you may graze with Cattel or horſe all that year after, and the next year take your crops as before at pleaſure.

Some Doubts and Queres concerning the aforeſaid directions propounded in a Letter from Dublin.

I Have diſperſed that Paper (of Sir *Ri. Weſtons* Directions, you did me the favour to ſend me about the Husbandry of Clover, and I am to return you humble thanks for it, though there doth remain a very matterial ſcruple about it, which is:

That if they ſow it with the Barley or Oats, it muſt needs ſpring up and be ripe before the Barley, and conſequently at the mowing of the Barley will either be mixt with it, ſo as not well to be ſeparated, or muſt be trodden down and ſpoiled by it.

This I being not able to anſwer muſt intreat you to take a little pains to ſatisfie me, and to communicate what you have experimentally been informed concerning it.

I am to ſolicite you alſo in the name of ſome young Husbandmen and other Improvers here, to procure them a parcel of choice, good, new and excellent Clover-ſeed, who are reſolved according as this takes, ſo to follow that Husbandry. As therefore the good ſucceſſe of this, will much incourage our young Undertakers, ſo if this Seed ſhould prove bad and not thrive, it would as much diſcountenance all our new Projectors.

The Doubts and Queres in the Letter from Dublin *reſolved.*

IN Anſwer to the Queſtions you make concerning the ſowing of Clover with other Corn, I can ſay that onely, which my experience hath taught me, *viz.* That Poliſh Oats are the beſt Corn to be ſown with Clover about the middle of *April*, two buſhels and a half, or three buſhels of Oats will be enough, which yeelding a middle crop of Oats at harveſt will ſhadow the Clover from the heat of the Sun, and leave the Clover (at the time of mowing) 2 or 3 inches high and no more, which will be a notable paſture in *September* or *October* following, and will (according to my experience) Winter 2 or 3 Sheep of an Acre. For the profit of the ſecond Summer, and ſo forward. A Kentiſh-man (by name Sir *Thomas Payton*) gave me this relation of his own experience, *viz.* That (by cutting of it and feeding of Cattel in racks under a tolle of trees) ſix Acres did maintain between the middle of *April*, and the middle of *October*, that is half a year) 13 Cows, 10 Oxen, 3 Horſes, and 26 Hogs, which at 12 *d.* a week for the Bullock or Horſe, and 2 *d.* for a Hog, comes to above 30 *s.* a week, which is 40 *l.* for the 26 weeks, which is not leſſe then 20 Nobles for the Summer profit of an acre, beſides what it yeelds in the Winter, which is alſo conſiderable.

Sir *Rich. Weſton*, applies this Husbandry to the improvement of barren ground, but my experience and judgement are, that the beſt improvement is upon the beſt ground, nor is 10 *s.* or 15 *s.* an acre conſiderable to the certainty which rich land gives to an improvement that is ſo great in it ſelf. The common practiſe alſo imploies this Husbandry by way of mowing of the Land; but my opinion is, and practiſe ſhall be to paſture it, which (inſtead of impoveriſhing the ground, as mowing by experience doth) will much better the ground

by the abundance of ſtock which is continually kept upon it, upon the ſame reaſon, as foddering of land doth.

Note alſo that the Clovergraſſe is moſt excellent food for Bees.

An Anſwer to more Queres concerning the Husbandry of Clover-graſſe.

Q. *THe quality of the ground Clover-graſſe delights in?*

A. Any light ſandy or hazel-mould-land, is beſt to bear Clover, and though barren land wil bear it, yet freſh and rich ground doth by experience return beſt profit.

Q. *The manner of preparing the ground?*

A. There cannot be too much coſt in preparing the ground, and making it free from all manner of other graſs.

Q. *The ſeaſon and manner of ſowing the ſeed?*

A. Clover is uſually ſown with Barly, Poliſh Oats, ſometimes with Flax, or with any ſeeds that are ſown in *April*. The beſt manner of ſowing that I have been able to learn, is to mix it by quarters of pounds or leſſe quantities, with ſuch proportions of ſand, as when all the parcels are put together, they may make two buſhels and a half or three buſhels, or any ſuch proportion as fits an ordinary ſowers hand, and thus it may be ſown (like any other Corn) with a full hand, ſome (at the firſt) did uſe to ſow 4 or 5 pounds upon an Acre, others have uſed to ſow 10 pounds, and I ſhall (next Spring) ſow more. It is uſually about the ſpring-time, ſold in *London*, for 12 or 14*d*. the pound, but by the help of ſome Belgick Merchant, it may be had, thence for 6*d*. the pound, or perhaps for leſſe.

Q. *The beſt uſe of it for Cattel?*

A. The beſt way (that I can learn) of feeding Cattel with it, is to cut it and to give it them in the Racks, within ſome little grown or ſhady places, and a proportion of ſwine will grow very fat with what falls from the Racks. In this manner (as I am credibly informed) 6 acres did feed all this ſummer time, more Oxen, Milch-cows, Horſes, and Hogs then

Feeding with Clover

then (not being my own experience) I am willing to name.

Q. *The way of ſaving or getting it out?*

A. To this my experience reaches not, but in this I am fully ſatisfied; that our own ſeed is beſt and freeſt from couſenage. It laſts three or four, or more years in the ground, according as the ground is good, and (at firſt) well peopled with it: This is all that my experiences reacheth unto concerning Clover.

Concerning the Threſhing of Clover-ſeed.

THe Clover-Seed, is a Seed very difficult to thraſh; They Muſt bee good Thraſhers that can Thraſh ſix Gallons in a day. The way uſed by a great Husbandman of *Clover* in *Kent*, is, firſt to Thraſh off the heads which eaſily part, which being ſeperated from the Straw, he uſed to Thraſh over again until it ſeem all as chaff or duſt, which after he winnowed with a Fan as long as the duſt flyeth out. Amongſt the duſt there wil remain ſome ſmall heads unbroken, which he ſeparated or Thraſht over again as before. I hope it will be no offence to give this publike notice that one Mr. *Stonghton*, a Gentleman that lives in *Norfolk*, hath for many years ſince uſed the Husbandry of Clover-Graſs, and hath an eaſie way by the help of a kind of Mil, to Shell the Husk from the Seed, whereby his Seed will not ſtand him in 2d. *per* Pound.

An Extract of a Letter written from Dublin, May 16. 1654. *concerning the Husbandry of Clover in* Ireland.

I Was at the charge for ſending for a hundred weight of Clover-graſſe ſeed, on purpoſe to incourage the chief of our friends here, to undertake the Husbandry of it, and when it came I ſowed ſome in my own ground, ſome I ſent to Col. *J.* ſome to Col. *H.* ſome to Capt. *V.* and to other Collonels and Officers of the Army. Lately I furniſhed ſome of it to two Gentlemen in the Country, that were excellent Husbandmen. And thus I diſperſed it, giving away ſome parcels, and ſelling ſome other, and ſowing the moſt part of it with others in Partnerſhip. But though I vſed that care, I did it to procure good ſeed, and though I am as confident of Mr. *M.* my friends care, who had it where you directed him, and ſtaid for it, while the Merchant told him he had new come over. Yet none of all theſe parcels I ſpeak of, ſo much as came up, ſaye one handfull of it which ſowed in my garden. And my friends here have ſufficiently abuſed me for it. Pray Sir preſent my humble ſervice to honeſt Sir *C. Culpepper*, when you write to him, and my thanks for his ſo free communications of his Clover-graſſes husbandry.

An Anſwer to the foregoing extract concerning the miſcarriage of the Husbandry of Clover in Ireland.

I Am ſorry the Hushandry of Clover, hath received ſuch a blaſt in *Ireland*, in its firſt eſſay, having obſerved how much more men are (ordinarily) ready, to judge of things, by the ſucceſſe of ſome one trial iil made, then to take the pains to weigh, and conſider in which of the particulars which belong (more or fewer) to every action, there may have beenſome failing. One

One of the moſt ordinary wayes of failing, which I have obſerved in this Husbandry is in the Seed, which comes to us ſometimes two yeares old, old, and very ſeldome other then what is mixed, and this I know by dear experience of my own heretofore, and of a very neer friends this laſt Spring.

A ſecond conſideration, is the ground, which (for a general Rule) ought to be light and tending rather to the ſand then clay.

A third but very conſiderable Obſervation is, that the ſeaſon be very clear and free of all other graſſe, or roots, and as fine worked, as if it were for a garden, which is a circumſtance not more neceſſary, then it is little obſerved.

A fourth Conſideration (though not ſo general) if the drought of the Fumer, which hath (as I hear) ſpoiled much Clover this ſpring, and not leſſe (I fear) then 20. acres of mine, if the ground have not helped me by its being proper and good. But if theſe particulars be well obſerved, I can (from my own and others experience) aſſure you, that it will (upon an eaſie account) double and treble the profit or rent of the Land; and that an acre (if managed by the Owner) will yeeld as much (to all intents) as 5 *l.* worth of other paſture. The greateſt fault which I find in this Husbandry is, that if the ground be ſtil cut or mowed, it will like Corn, impoveriſh the ground; for no man can eat his cake, and yet ſtill have it; to prevent this great inconvenience, and to turn it to an advantage, my ſelf intends to try how it will thrive, and what return it will make, being paſtured. I have known already the experience of ſome who have this ſpring, (before there was any paſture elſewhere) kept 8 Sheep of an acre, which is double the proportion, which the beſt land in *Rumney Marſh* will bear; if this, upon trial, prove well, I cannot but think, that this way of paſturing of Clover, will be a kind of foddering of the land, and rather improve then impair it.

An Extract of another Letter in reference to the foregoing Answer.

PRay thank Sir *C. C.* heartily, for his accurate Animadversions upon Clovergrasse; upon consideration of which I am pretty well satisfied. We failed in the point of Husbandry and ordering the Land, sowing it somewhat rudely as is done with other grain. But though this was the failer, the discredit falls upon the Climate, so quickly are mens patiences tired, and so easily are their judgements abused, as Sir *Ch.* very well observes, being ready to suspect and accuse any thing, rather then our own error.

More Extracts of Letters concerning French Seeds, of St. Foine, and Lucerne, Paris 23. Novemb. 1652.

THe name of St. Foine is in some parts of *France* communicated to Lucern, although the generality thereof have appropriated the same to another kind of fodder, extreamly differing from it all manner of ways, *viz.* the *Onobrychis Antiquorum*, wherewith *Medica*, (that is the true Latine name of Lucern) hath nothing common. When I find an opportunity, I shall send you some of the seed of each, according to their usual denominations here, the sight whereof and much more its planting, will soon convince all contradictors.

Paris, Decemb. 21. 1652.

I have delaied the sending of the seeds of St-Foin and Lucern, because I thought they were desired for sowing, to see what

what herbs they would produce, for which end they would have come time enough two or three moneths hence. But seeing that the sight of themselves is desired, you shall have them out of hand.

More of Lucern, Paris, March 22. 1653.

DR. *H.* told me, that a Merchant who dealeth much in Oranges, Lemmons, and other Provence Wares, had told him, that within a few days he expected 10 or 12 mules loaden with those commodities, among which there would be good store of Lucern seed, and that of 3 several sorts, for so many there is, which I never knew before, and Dr. *H.* shewed me Paterns of every one of them, having got them of the said Merchant. Therefore I wished him to send unto Sir *C.* not 25 *l.* of any one of them, we not knowing, nor able to learn here, which is the best sort, but 5 or 6 *lib.* of every sort, the which Sir *C.* having sown all, and seen them grow, he may consider which he liketh best, and have of that as much as he pleaseth the next year.

The Answer.

Of the 3 sorts of Lucern, mentioned in Dr. *B.* Letter of *March* 22. 1653. my desire is, to have of each sort, as much as will plentifully sow an English Acre, and rather more than lesse. I shall under correction of better experience, write my own apprehensions, concerning the quantity that serves for an Acre, *viz.* That of that Lucern seed, of which I received formerly a sample, 15 *lib.* if good, will sow an acre of the other 2 sorts of seeds, if bigger there must be so much more, if they be lesser seeds, there must be so much lesse or fewer pounds of each kind. This still supposed, that the seeds be naked, and not, like St-Foin, closed in a cod; for in that case, there ought another consideration to be had of it.

More Queries about Lucerne, *and the Seed called* Esparcet.

I Am well acquainted with the *Saint-Foyne* Seed, which you received from *Paris*; but as for the *Lucerne* seed, I doe upon sight of it conceive it to be no other than the Clover seed, that is commonly procured here from *Flanders*, being meliorated in *France* only by growing nearer the Sun. And therefore I heartily wish, that you friend could certifie you of his certain knowledge of the *Flanders* Clover-seed, and of the different natures (if any) of those two seeds. But howsoever it prove, I should be very glad if by your friends kindnesse I might by the first of *April*, or before, receive twenty pound weight of the *Lucerne* seed, such as is good, and of the last years growth.

There is another French seed called *Esparcet*, and mentioned (by the Author of *Theatre d' Agriculture*) to grow usually about *Die* in *Daulphine*. I cannot conceive but that a seed of that excellency cannot, but (since that Authors writing) have spread it self the nearer to *Paris*.

If by your Friends favour I could have his knowledge of that seed, a pattern of it, and (if it be to be had) ten or fifteen pound weight of it by, or before *April*, you would much oblige me.

The Answer.

AS to the Qu. of Sir *Ch. C.* I know not the *Flanders* Clover, nor the seed of it, and so can tell nothing of its agreement or disagreement with *Lucerne*, whereof I will send the desired quantity, if it may be had, whereof I make some doubt; for some weeks since, to my knowledge, there was but one shop in Town that had any, which was the cause that

that the price was doubled, and from eight *sols* come to sixteen; and I doubt not but it hath been enhaunced since, if any one be left.

As for the *Esparcid*, I could never yet meet with any here who could tell me what it was, it being long since that I have enquired after it for mine own curiosity, finding it spoke of in the *Theatre d' Agriculture*. But if I be not hugely mistaken, it is the self-same with that which in these parts is known under the name of *Saint-Foin*, and whereof I sent you the seed lately with that of *Lucerne*.

P. S.

What I told you out of my conjecture, that *Esparced* is the same with *Saint-Foin*, that I can now give you for a certain truth, Dr. *H.* having found it so by his Enquiries.

The differences between Esparcet, *and the other French Seeds.*

SErres in his *Theatre d' Agriculture*, hath a Chapter by it self concerning *Saint-Foine*, which (by the tenor of that Chapter) he seems to me to intimate to be the same with *Lucerne*. In the very next Chapter to that of *Saint-Foine*, he treats of this *Esparcet* in question, and by comparing of both Chapters there will be found these differences: *Saint-Foine* requires the best sort of ground, and is tender; but *Esparcet* is a very hearty hearb, and grows very well in barren ground. *Saint-Foine*, by *Serres*, is mowable five or six times a year; but for *Esparcet* it will be mowed but thrice a year. *Saint-Foine* endures in the ground (upon once sowing) twelve or fifteen years; but *Esparcet* (by the next Chap.) endures but four years. *Saint-Foin* grows ordinarily in *Languedoc*, *Provence*, *Dauphine*, the Principality of *Aurange*, and in the region about those Provinces; but *Esparcet* is reported to grow only about *Die* in *Dauphine*.

Theſe ſeveral differences mentioned by *Serres* make me conceive that the ſeeds are not the ſame, and that if *Eſparcet*, upon enquiry cannot be found at *Die*, it is loſt either in deed, or at leaſt in name ſince the time that *Serres* lived, which yet, of a thing ſo profitable, and once in practice, is hard to apprehend.

The laſt Advertiſements concerning Eſparcet, *and the other French Seeds.*

I Have ſent to *Calis* by the *Chaſſemarais* a ſack of *Saint-Foine*, containing two Engliſh buſhels; and in the ſack I have put three ſmall canvas bags of three ſorts of *Lucerne*, of *Holland*, of *Flanders*, and of *Paris*; but two pounds onely of each ſort, becauſe I fear they are too old, and will not grow, and therefore I ſend them rather out of curioſity than otherwiſe, the price being not great. The new *Lucerne* ſeeds of *Provence* and *Dauphine* are not yet arrived, but daily expected, and ſo have been theſe three weeks. If they come time enough to be ſent ſo as that they may be in *England* by the time your friend appoints, I will not faile to ſend what he demandeth. As for *Eſparcet*, whereof *Serres* makes mention, and which *Dalechamp* ſaith is called *Sparſſe* at *Die* in *Dauphine*, who puts both the deſcription and the figure of it in the words *Polygala* and *Onobrychis*, I have enquired particularly of it, and they write to us from *Die*, that they have ſuch a graſſe, but that 'tis mixed with divers other ſorts of graſſe in their *Saint-Foine*, and that there be no particular ſeeds to be had of it alone. And I perceive by *Renard* the famous Gardener of the Kings Garden of Simples, that of thoſe ſorts of graſſe ſpecified in *Dalechamp*, under ſeveral names and figures, as *Lucerne*, *Hediſaron*, *Polygala*, *Onobrychis*, are all but ſeveral parts of *Medica* or *Saint-Foine*, and that their ſeeds are not to be found diſtinctly

ly ſeparate one from another. If any man would be ſo curious, he might ſow them all together, as they are to be had under the titles of *Lucerne* or *Treſle*, and gather the ſeeds of them diſtinctly according as he ſhall find their divers ſhapes correſpondent to their ſeveral figures in *Dalechamps* or *Cluſius*.

A Letter of Dr. J. S. *relating the Husbandry of the French Tares or Fetches.*

SIR,

IN my voyage from *Paris* to *Roan*, I obſerved divers fields, as I thought, of the hearb called *Aphaca vicia*, or Tares and Fetches, and in them horſes feeding, but not at random, being by the means of a rope allotted onely a certain ſpace ſome four yards about; and this ſpace was thought ſufficient for one horſe in one day. But being in the Coach in company with a Gentleman of the Country, who underſtood ſomething in Husbandry, I made theſe following Enquiries.

1. *What it was called?*

A. Was, *La Romagne*.

2. *If every year ſown?*

A. It was, but if it was not, it would not ceaſe to come, though not in ſuch abundance.

3. *How often mowen?*

A. Not but once, not that it might not be oftner moven, but becauſe being green, and ſo eaten off the field, the cattel fatned on it, they were willing it ſhould be ſo to ſpare their hay. He ſaid likewiſe, that it was of ſo quick growth, that one furrow but of a competent length, was ſufficient, and more for one horſe all graſſe time over, which he accounted from *April* to the latter end of *Auguſt*, and then being ſpared for a time, it might be mown and kept dry, and given in the Winter to Horſe, Oxen, and Sheep, either alone or

or mixed with other fodder. I asked how that a horſe eating on one furrow alwaies could be ever a freſh ſupplied. He ſaid, that every day he was to be carefully changed, and that beginning at one end of the furrow, and ſo going on to its middle; then he was to be ſhifted to the other end of the furrow, and in like manner to proceed till he come where he had left before, and by that time the firſt end, where he firſt begun, would be ſufficiently grown, and ſo as he had eaten it before *gradatim*, ſo he found it again growing *gradatim*, and ſo good paſture again. Moreover I inquired, what difference he made of the profit the Lucerne brought (for he knew it well) and that of *La Romagna?* He anſwered, that the Lucerne certainly went beyond this, but that they uſed the one and the other, according to the nature of their ground, beſides that that ground, which was allotted to the Lucerne, ſhould be for many years; for once having got root, it was not ſo eaſily eradicate, and ſo not fit for any other uſe, but that the field of *La Romagna* might be changed, according to pleaſure, beſides the ground which was fit or *La Lucerne*, was not for *La Romayne*, *& è contrà*. For Lucern required more humide places, and *La Romagne* more dry.

This is the ſubſtance of what I remember paſſed betwixt that Gentleman and me, which how true it is I dare not promiſe becauſe having it, but from one hand, and that a ſtranger to me; but thus much I remember, that ſome *York-ſhire* men in the Army in *England*, were more glad to find a field of Fetches to feed their horſes on, then if they had found both Hay and Oats, and that they have often to my ſeeing left excellent graſs to ſeek after theſe Fetches.

Sir, I think it will not be amiſſe in the further inquiry of this, to ſee the affinity between the *Vicia* or *Aphaca*, the *Lens*, and the *Ervum*, for all of them according to *Dioſcor.* have that fatning quality, and truly I cannot well tell, which of theſe certainly is *La Romayn*, though I incline to think that it is the *Vicia* or *Aphaca*; for being in a Coach, I was too negligent to go out and remark it more narrowly, but may be

eaſily

eaſily known of any whom you may inquire of. Thus I pray God to bleſſe you in all your noble indeavours, and ſo I ſhall continue to pray,

Sir, *Your moſt devoted to ſerve you.*

An Obſervation upon the Husbandry of the French Tares or Fetches.

THe Forther herb, about which you have communicated unto me, Dr. *S.* notable obſervation, is certainly the *Vicia* or Fetches, the which I have ſeen cultivated in divers parts of *France* and of *Holland*. But it was never my luck yet, to learn any particulars about the properties and uſe thereof. If I do at any time hereafter, you ſhall be ſure to hear of it. Having written thus far, I am told by divers, that the *Vicia* or fetches are ſown for to give the dried grain of it to horſes, in the ſame manner as Beans, but that they never knew the green herbs to be uſed for them, or any other cattel in the nature of fodder.

Another Letter relating the Braband *Husbandry of Spurry-ſeed.*

SIR,

THe Spurry-ſeed which you have gotten out of the Low-Countries, grew no doubt in light ground. And accordingly, if it were mine, it ſhould again be ſowen in the lightſt ground I had. Though for trials ſake I might perhaps beſtow a handfull or two upon every ſort of ground neer me.

The times of ſowing it are twice in a Summer. The firſt time is not very early. I ſhould not adventure to ſow Dutch ſeed in *England* before the middle of *May*; leaſt, being a ſtranger, it ſhould take it unkindly to meet with cold *May* mornings, and diſcourage me. In *June* and *July* it will be in flower; and in *Auguſt* the ſeed is uſually ripe.

The ſecond time of ſowing is after Rie-harveſt; when the Brabant-husbandman preſently ploughs up his ground and

ſows it with Spurry-ſeed, that it may grow up and ſerve his Kine, after all late-graſſe, and Rowens be eaten up, even till New-years day. So that this latter ſowing yeelds no ſeed, but is eaten up green; and the proviſion for ſeed is made by the former ſowing.

It will be good in this firſt triall, to ſow it in ſeveral parts of the ſame ground in different proportions, and to mark which thrives beſt: As alſo in the ſame ground, and with the ſame proportion of ſeed, to try what difference of increaſe there is, between the ſeed newly threſht out and thrown into new ploughed ground, and that ſeed which is at the ſame time a year old.

It is ordinary in *Brabant* to ſell away their *May*-butter, and to make their Winter-proviſion for themſelves, and their more knowing cuſtomers, in the end of the year. For many of them prefer Spurry-ſeed before *May*-butter. I ſuppoſe the principal reaſon is, becauſe it is not ſo apt to grow rank with that Summer heat, which *May*-butter muſt indure in *June*, *July* and *Auguſt*.

I have known ſome *Brabant* Husbandmen ſow Tolls, that is, ſmall round Turneps among their Spurry, in the latter ſeed-time, as being alſo good to increaſe the milk in their Kine.

Some *Brabant* women give Spurry to their Hens, that will catch it from one another, as they do Chick-weed. They beleeve that it makes them lay the more Eggs.

Spurry is by ſome eſteemed a ſure remedy for a cut or green wound, if it be bruiſed green and layed to the cut, *&c.* In Latine its called *Spergula*.

The

The Deſcription of the Hop Clover, *or* Trefoil, *in Engliſh* Three Leaved Graſſe.

THis *Three Leaved Graſſe* will grow half a yard in length or more, and at every two Inches, it hath a knot with Leaves and a Bunch of Seed, which is black, almoſt like Onion Seed; both the Graſſe and the Hay made thereof, is finer and ſweeter then the great *Clover*. It will grow in any Ground, and being once planted, it will ſhed ſo much Seed, that it need never be planted again. It may be ſowen with Corn, or without, as they do the great *Clover*; or being ſprinkled in Meadows, it will exceedingly mend

the Hay, both in burthen and goodneſſe.

Such as are deſirous to buy any of this Three Leaved Graſſe, *or* Lucern, Spurry, Clover-graſſe *and* Sinkfoile *Seeds, what quantity they pleaſe may have them at* Thomas Brown's *Shop at the* Red Lyon *in* Soper-lane, *where they may likewiſe ſee ſome of the Hay made of this* three Leaved Graſſe.

Of the long Engliſh graſs in Wiltſhire.

THe long graſſe in *Wiltſhire* mentioned in the Legacy, is occaſioned by reaſon of a ſpacious Sheep-Common adjoyning. For that every haſty ſhower waſheth off the Soil of the Common, and bringeth it into a little Meadow beneath, which maketh it incredibly fruitfull.

Some

Some Phyſical uſes of Milk, and of curing the Black Jaundies, &c.

I Thought to have imparted unto you the Secret how to preſerve Milk from ſowring, but I muſt refer it to a perſon of ſingular Honour, Piety, and Experimental learning, who had made ſome trial of it, but hath not yet fully ſatisfied his minde about it. When that is done, I know you will have it before any other, the Gentleman being wholly devoted not onely by this, but many other very Noble and uſeful Experiments, to promote the good of Mankind.

As for Doctor *Ziegler's* Germane Book, written purpoſely on the ſubject of Milk, when I viſited him at *Zurich* he ſhewed it me, not fair written for the Preſs. It will not be great, unleſs he reſolve to an much of his own experience. For he tells mee, that being miſerably infected with the Black-Jaundies in *Pruſſia*, and having been purged by the Phyſicians of that Country, with above 30 ſeveral ſorts of purgations, even the moſt violent that they could think of, he found himſelf never the better. Whereupon he reſolved to take no more of their counſel, but to try ſome concluſions of his own. And with the ſole uſe of Milk he was perfectly cured. Beſides he tells me that he hath ſeveral times, finding himſelf in ſome indiſpoſition, prevented the returning of ſome hereditary diſeaſes in himſelf, by abſtaining from all manner of meat and drink, and living upon meer Milk, ſometimes for fourteen days together. And I remember heretofore I have heard him ſay, that Milk is hurtfull with other meats, but alone it is of unknown vertue. How much of this and the like, he will ſay in his Book, I know not. Some other things he ſaid at the ſame time, which I meant to have added here, but I muſt defer them at preſent.

Obſervations concerning Oyles.

I Gave Dr. *Zeigler* occaſion to ſhew me *Balſamum Samaritanum*, as he called it. He ſeemed to ſay, that *Paracelſus* firſt gave it that name, in memory of the *Samaritan* in the Parable, *Luke* 10.33. For this Balſam, he ſaid, was made of meer Oyl and Wine boyled together without any other ingredient. But, ſaid he, whoſoever ſhall goe about to boyl them together ſhall find it troubleſom, if he never ſaw any practice of that kind before. I told him, that ſome Atheiſtical heads ſay, that *Luke* might be a good Phyſician, but he was but a bad Chirurgion, if he knew not that Oyl muſt not be put into wounds. The Doctor anſwered, that the Objectors were no great Chirurgions, if they did not know, that Oyl was hurtful onely in thoſe wounds that reached to ſome bone; for then the Oyl would make the bones *cariosa*. But ſaid he, if ſuch a thing happen, *caries oſſium* may be cured by Chymical ſalts.

From this I gave him occaſion to ſpeak further concerning Oyl. He told me, that when he was in *Italy*, he underſtood that ſome families there were wont to preſerve Oyl from Generation to Geneaation, and to divide it equally amongſt the children, or neereſt kinſmen of the deceaſed. He had ſpoken with one Italian Gentleman, that ſaid hee had about two ounces of Oyl that was three hundred yeares old.

I asked him, what ſerious uſe there was of ſuch old Oyl, beſides the vanity of boaſting of ſuch Antiquities? He ſaid, that new Oyl hath a ſaltneſſe in it, which makes it unfit for many uſes; but time deſtroyes that ſaltneſſe, and makes it able to perform ſuch effects as ſome of the Antients have reported of it. They ſay, that divers who were eſteemed dead, have been annointed with old Oyl in the five principal pulſe-places, and revived. And, ſaid he, I am apt to think that the Extreme Unction, now adaies applyed to men at the laſt gaſp, had its firſt riſe from that Experiment; for I would thank any man that could tell me what kinde of Oyl it was

that

that is mentioned *James* 5.14. An Apothechary of *Padua* proffered to sell me Oyl, which he said was fifty years old: but I bought none of him, partly for the greatnesse of the price that he demanded, and partly for the uncertainty whether it were indeed so old as he pretended.

How to make better Butter than ordinary without setting the Milk for Cream.

THe Milk so soon as it is come from the Cow must be strained, then churned as usually Cream is done. Also the Cheese made of theButter-milk wil be better than the best two meal Cheeses that you ever did eat. And one pound of this Butter shal be worth a pound and a half of your bestButter which is madeof Cream. *Probatum* by a Gentlewoman, a great Huswife, dwelling in the Isle of *Ely*.

Of Chedder Cheeses where they are made?

THe Legacy of Husbandry mentioneth the best Cheese to be made at *Chedder* in *Wiltshire*; I suppose it may be a mistake, except there be two *Chedders*. For *Chedder* is a place in *Sommertshire*, between *Mendip* hils and *Axbridge*. I suppose it is bet one Parish, or not much more, and that a great part of it is a Moor called *Chedder-Moor*. I have been at *Mendip* Hils and seen this *Chedder* lying much lower, & was told that the best Cheese in *Engl.* was made there, and that it was sold there at six pence a pound, that usually they made great Cheeses, from twenty pound to a hunnred and twenty pound in weight, and that it was usual when one made a Cheese to borrow all the Milk of his neighbours about him, and that some did borrow as much milk in one day as they were a month in paying back again.

Objections anſwered againſt Propoſitions of Improvement by Agriculture, and other the Branches of good Husbandry.

THat if this Art, Trade, or Profeſſion of Husbandry were indeed ſo beneficial, ſo profitable as many pretend, why then are there not more Rich men of that ſort? And why doe ſo many Farmers or Tenants in this Nation live ſo poorly and beggarly that they ſeem rather the Landlords ſlaves or ſervants then tenants, ſince all they get, ſaving their own very mean ſubſiſtence, goes to the paying of their rent?

To this it's anſwered: Firſt, that that the poſition is in its ſelf a miſtake, there being more that mannage theſe rural affairs Rich, than of any ſort of people or profeſſion in the Nation beſides by far.

Secondly: It's affirmed, that the moſt noble Families in the Nation have been either raiſed or upheld by the Plough, *&c.* For it is obſervable, that nothing more enables a Perſon or Nation than Hoſpitality; this, for all that, becomes the bain, the deſtruction of many great Families, when the bountifull hand is alone, but when the one is as induſtrious by theſe very wayes of good Husbandry, to provide or bring in as the other is to give or let out, that man onely is the good Houskeeper, that man onely is the conſtant Friend to the poor and his neighbours, that man only is the wiſe Bee, that knows how to gather, and give the honey without defacing the fair flower of his eſtate, which he alwaies leaves to his poſterity well encreaſed, whereas the other ſeldome dies undeſtroyed.

Thirdly: It's affirmed, that there are at this time very many Graſiers, Sheep-maſters, and Corn-maſters in this Nation of very vaſt eſtates, and thoſe accrued in their own times by their own endeavours in theſe waies of good husbandry.

Fourthly: Suppoſe it were not ſo, as it's granted in the more

more common and general account it is not, yet the fault is not in the Profeſſion but in the Practice and Perſons: for the more common, mean, and vulgar ſort of Tenants or Husbandmen improperly ſo called, have onely ſome general, rude, imperfect, and (in many caſes) much irrational Rules, or Cuſtomes rather, which their as ignorant Fore-fathers left them, from which they can no more be weaned than a dull ſturdy Aſſe can be gotten to mend his pace. And they are generally ſo averſe to all new practiſes, that it is found meerly impoſſible to infuſe any ſuch thing into their heads or hands by any other means more than one manifeſt example, and that under their noſes too.

Amongſt their irrational Cuſtomes, I reckon that of bandying with the Lord, though never ſo juſt and ingenuous, about incloſing their Commons (the Freeholder and Coppyholder I mean) chuſing rather to keep three ſtarved Sheep than one good Milch-cow, which the ſame land incloſed would in all probability doe.

Alſo their opening their fields at *Lammas*, or ſome other certain time, which as ſome years proceed, cauſes the loſſe of much Corn; not to them onely but to the Common-wealth, ſince if any man have (by an un-foreſeen, or not to be remedied cauſe) his Corn out later a little, he is forced to fetch it in ripe or unripe, wet, or dry, leſt the known greedineſſe of the neighborhood put in their Cattle, and eat it up before his face.

Alſo their old Proverb (in in it ſelf wiſe and good, but as they underſtand and uſe it, moſt prejudicial) A little land wel tilled. For though it be an undoubted truth that one Acre worth twenty pound, all charges defrayed, is better than three or four worth five pound all charges defrayed; yet it is as true, that if my neceſſary expences require threeſcore pounds *per annum*, and I hold threeſcore Acres, worth twenty pound each clear, I have gained no more but my bare ſubſiſtence, and have nothing to lay up for poſterity, no nor to ſtop a gap with (which yet often happens) and being not ſtopt, makes others ſtoop to beggary, whereas had I ventured (as they will needs call it) upon an hundred and twenty

Acres, I had had threeſcore pounds to ſtop gaps, and lay up for poſterity; and farther if this ſhould be rightly caſt up by a rule of Progreſſion, it would eaſily appear, that threeſcore pound driven on again, and each year augmented, would in a mans life riſe to a plentifull fortune for his poſterity, and after a while afford him ſome better way, or rate of ſubſiſtence alſo. What ſhould a man ſay but conclude with the Proverb, He that is born under a three penny Planet ſhall never be worth a groat.

If it be anſwered, that much Land is barren, or uncertain; and the more one deals with, if the year proceeds evil, the greater his loſſe, the more certain and deſperate his undoing. 'Tis anſwered, That to a good Husband this ſo rarely happens, and he by the meanes aforeſaid, and other good waies, is ſo prepared, that it perhaps may hinder his going forward for that year, but ſhall not pluck him back at all.

And here alſo is the ſtubbornneſſe of theſe mens natures diſcovered, that when moſt rational approved good Inventions or Wayes to make their barren or uncertain land bear good crops to prevent or cure the Rot amongſt their Sheep, or Murrain amongſt their cattle, they utterly refuſe the motion, deride the Movers and Inventers, and (as much as in them lies) endeavour to retard or poyſon the practiſe, leſt their ſordid ignorance and wicked envy ſhould be thereby diſcovered or prevented.

Certainly he that (having any conſiderable ſtock to begin with) doth firſt carefully inform himſelf, and conſider what, where and how to proceed; and ſhall do ſo cheerfully, and throw himſelf upon Gods abundant power, wiſdom, mercy, and providence for the ſucceſſe, cannot fail to be as rich as a good man will deſire to be; and he that withſtands or refuſes ſo to doe, I can liken him to nothing more properly than to the dog in the manger, that eats not hay himſelf, nor lets the horſe that would.

I am ſure that the moſt rich men the Scripture tels us of, were of this ſort (that were inſtrumental to their own greatneſſe,

neſſe, and not born ſo) witneſſe the hiſtories of *Abraham*, *Iſaac*, *Jacob*, *Lot*, *Job*, good men, or of *Nabal*, or the Rich man in the Goſpel, that hath his barns full, and goods laid up for many years.

And prophane ſtory tell the ſame, that *Jupiter* for his invention and practice in husbandry, was honoured as a God; that *Cyrus* and *Tamberlane* were Sheepherds, *&c.*

An approved Experiment for the cure of the Faſhions in Horſes, and the Rot in Sheep.

A Gentleman of note an Engliſhman had a ſtrange felicitie in curing of Horſes of the moſt deſperate diſeaſes, as alſo Sheep ſtrangely, ſuddenly and perfectly, by which he was much enriched and admired.

And it was with no other thing, but the uſe of the Antimony-cup ſteeped in Ale with a little ſpice they call Grains, and a little Sugar, of which he would give them onely ſuch a quantity as would not much weaken them, and ſo give it two or three times, with perhaps a day or two dayes intermiſſion. To horſes he would adminiſter half a pint at a time; to Sheep not above two or three, or at moſt foure Ounces; by which he hath in a ſhort time cured the Faſhions in horſes and the rot in ſheep. Indeed Antimony is ſo great a reſtorer of the Liver, or ſo great a purifier or refiner of the maſſe of blood, that I my ſelf have known many recovered of the Dropſie, and other deſperate diſeaſes by the uſe of it. The ſame Gentleman uſed alſo the ſame infuſion to waſh all ſores that were broken out upon them, which alſo conduced much to the healing them. He uſed it alſo to Swine.

Note. The Antimony-cup is no other than a pure ordinary *Regulus Antimonii*, caſt into the form of a Cup hath no other virtues nor effects, then the foreſaid *Regulus*: For this *Regulus* lying in any liquor doth the ſame which the Cup-holding liquor in all reſpects. So much of this *Regulus*

as may ſerve your turn may be bought for two ſhillings, or half a crown.

Another approved Experiment for fatting of Hogs, and preſerving or curing of them from Meazeals or other Diſeaſes.

IF a Hog that is to be fatted, have half a dram of crude Antimony given him in his meat three dayes before he be put up to fat, it will make him have a good ſtomack to his meat, and therefore he will ſoon be fat, and it will likewiſe cure him of all foulneſſe of his Liver, and of the Meazels, which are very frequent in Hogs. The ſame is as ſoveraign for any other beaſts.

Another excellent Remedy againſt the Rot, and other diſeaſes in Sheep and Horſes.

TAke Serpents, or (which is better) Vipers, cut their heads and tayls off, and dry the reſt to powder. Mingle this powder with ſalt, and give a few grains of it ſo mingled now and then to your Horſes and Sheep; it is good againſt moſt diſeaſes in them, and chiefly againſt the fat Rot.

Whether a good Lime may be made of Pibble and other Stones, whereby Land may be dunged and enriched.

YOu ſay your great friend the Doctor in Chymical Phyſick hath a way not onely to turn the ordinary Limeſtones into Lime whereby Land may be dunged and enriched, but alſo Peble and all other ſtones into Lime at an eaſie charge, and ſo every Country that hath not the natural Lime-

Lime-ſtone may have it now out of other ſtone, and ſo ſave carriage.

To this I anſwer.

*A.*1. What *Glauber* hath written in his firſt Part *Operis Mineralis* of Peble or Flint-ſtones is to ſhew how to extract out of them not quick or unſlackt Lime but Gold, and that by the mediation of ſpirit of Salt, which muſt be made firſt good cheap, and in abundance. What your Doctor undertakes muſt be left to tryal whether it will ſucceed or not.

*A.*2. I believe the Doctor, who pretends to make Lime of Peble may make his undertaking good, ſeeing that in *Holland*, in *Italy*. and in many parts of the *Eaſt-Indies*, they make it of the ſhels of Oyſters, and of all kinds of Shel-fiſh, and that *ex ſilice ipſo* (out of Peble it ſelf) Lime hath been made many Ages ſince, as *Pliny* and *Agricola* tell us. But I know not whether the Doctor be aware of the inconvenients which the Flint-Lime is ſubject unto, *viz.* that it is nothing ſo good as other Lime, and that in the burning of it, great part of the Flint, in ſtead of being converted into Lime, turneth into a kind of glaſſie ſlack.

The manner of Planting Timber-trees in Cornwel.

I Have obſerved a ſort of Husbandry in *Cornwal*, which I like exceedingly. Namely, that upon their Mounds or Fences (which are high and thick banks almoſt like Fortifications) they doe ſet or ſow Oak, or ſome other wood, which thriveth ſo well, that I have ſeen the Wood growing upon one fence, that parted two Cloſes to be worth four or five pound. This kinde of Fence doth much preſerve the Land from Malignant Aires, and is withall more than three times profitable beyond what that ſame Land the bank ſtands on would yeeld, if the banks were taken away. The beſt reaſon to be given for the well growing of this wood, is the mixture of earth and great ſtones, whereof the bank is

made, amongſt which the Roots take ſo firm hold, that no violence of weather can hurt them, and by the ſame reaſon the roots are ſafe from the prejudice which other Trees receive by the ſuddain and unnatural ſuffering by heat, cold, moyſture, or drought.

How to haſten the growth of Timber-trees.

WHen any young Trees, as Oak, Birch, Elm, Aſh, &c. (but Aſh eſpecially) are in their bodies about two inches diameter, which they (oftimes) be at three or four years growth, then if you take a peece of an old coat of Male, or ſome like Net of ſmall wyre, and holding it in your palm, rub it pretty hard (ſo as you tear not the bark) up and down the body of the Tree, twice every year, you ſhall find that Tree far to outſtrip his fellows of the ſame age and kind. If you ask the reaſon, let the example of friction or ſeaſonable rubbing or dreſſing in a horſe or other cattle be conſidered, which ſooner be fat and fair, and that with leſſe provender than the like horſe ill kept.

Note. That one man may well look to three thouſand, and do much other buſineſſe, which is not above an half penny a year a peece, but the Tree ſhall be better'd in its growth at leaſt two pence a year.

As for thoſe kind of Trees called *Flanders* Aſhes, whereof ſome young ones were ſent for, and planted in the drained Fens of *Lincolnſhire* by Dutchmen, I have it onely by relation, but from able men, that the charge was three ſhillings a Tree, and that they grew ſo faſt, that at three years growth they were worth twenty ſhillings a peece for Timber. Doctor *H.* ſpake of an Apple called the *Gennet-moyle*, that makes the beſt Cyder, that every ſlip of the Tree will grow; that the Trees are great bearers, and the ſlips will grow to bear fruit in three years.

Of

Of Turky-Beans *to be more frequently planted.*

THere is a ſort of Beans (which grows in many parts of *England*, namely in the Iſle of *Exholm* in *Lincolnſhire*) that are called Turky-beans, very large and yeelding a great increaſe, to be eaten with a little butter and vineager (after they are boyled) ſhels and all, they are ripe about *July*, or later if you pleaſe, and will come ſeaſonably to ſucceed our Haſting-peaſe, and if more frequently planted might be afforded cheap.

A Friendly Advice how a hundred and and fifty pound may be improved by Husbandry to yeeld a farre greater increaſe than if the ſaid ſumme were imployed in a way of Uſury upon Uſury.

IN anſwer to your Queſtion (*viz.*) how a Friend of yours might diſpoſe of a hundred and fifty pound (or any other ſumme) to the beſt advantage, I humbly tender you my opinion (thus) that ſumme may be turned and returned continually to no ſmall advantage very many wayes, I will onely inſtance four (*viz.*) by Sowing or Ploughing of Corn, Flax, Rape, or by breeding or feeding of cattle, any of theſe will (almoſt) double the ſumme every year. For example, a hundred and fifty pound will plant (I mean in the moſt excellent way, and conſider alſo the dearneſſe of the preſent time) about forty Acres with Wheat, which (by the ordinary bleſſing of God) cannot be leſſe worth than eight pound one Acre with another, which in all amounts to three hundred and twenty pound; which again the next year according to the like account will advance it ſelf to ſix hundred and forty pounds, that is to ſay, it will plant eighty Acres worth eight pound a peice at Harveſt. And from thence forward,

if

if you deduct one hundred pounds yearly, for an increaſe of preſent maintainance. Yet your ſtock will increaſe far more than by Intereſt upon Intereſt, which is alſo nothing ſo juſt or ingenious a way of getting. And if you ſay your friend is not a man addicted to, or experienced in theſe wayes of Husbandry, or of ſuch employments otherwiſe, as will not allow him to act in this way himſelf, give me leave to ſay he may doe it, by the aſſiſtance of ſome faithfull friend (which is not impoſſible for you to find, or make by thoſe abundant obligations you uſe to lay upon all men) ſuch a friend as is skilful and active in theſe moſt pleaſant and honeſt wayes. To turn the ſame ſtock in Cattle will amount to near the ſame profit, but either of the other (*viz.*) to ſow Flax or Rape, will be yet much more profitable, and increaſe your preſent Revenue and Stock alſo faſter.

Sir, I humbly adviſe your Friend to take ſome one of theſe wayes by the help of ſuch a Friend, which ſhall never want the beſt furtherance I can give it, which is my earneſt prayers for an extraordinary bleſſing upon ſuch honeſt endeavours, which will in a few years (and that in a way moſt pleaſing to God, and approved of good men) make a very competent proviſion for himſelf, and his living, and leave a conſiderabie eſtate to thoſe that ſucceed.

Another friendly and more particular Advice how by a good husbandry of Rape-ſeed to raiſe an Eſtate, or provide Portions for Children.

**The ſeaſon when to begin this Work is preſently after Midſummer.*

A Laſt of Rape-ſeed is ten Quarters. or eighty Buſhels, and three ſhillings is the ordinary price of a buſhel.

One Acre is ſowed with half a peck ſufficiently, and will yeeld replanted, according to the goodneſſe of the ground and ſeaſonableneſſe of the year *, 40 *l.* 30 *l.* 20 *l.* and at the leaſt 10 *l. per* acre.

The whole charge to ſow an Acre, and all things thereto be-

belonging first and last will stand in three pound Rent and all (for the Rot amongst the Sheep, and Murrain amongst Cattle, must needs make Land cheaper.)

If therefore there were found a hundred men of indifferent quality, that would disburse each man ten pound sterling, and commit all their stocks into one hand to be managed by that person (as one that is known to be skilful, and so able to undertake and pass through the work) for the raising of a portion for their child, or children respectively, they would finde this advantage thereby (*viz.*) They should onely spare the said ten pound for the two first years and no more, at the end whereof it should be returned, and so they have given that child no other portion point-blank more than the use of ten pound for two yeares, which is but two and thirty shillings.

If 100 men be not found that will undertake or engage, fewer will serve, so they either engage 20 l. or 30 l. for 2 or 3 children, or at least for the first or second year allow the Steward more than is here accompted.

2. They should be at no charge to keep or maintain the same child save onely the first two years, for at the end of the third year they should receive competent maintenance for the same year, and so continue, or increase the same so long as the grand stock is suffered to lye in the Stewards hands, which is to be understood that during the first seaven yeares the Steward cannot give it up but by consent of the owner, but after that he may ease himself of the burthen when it grows too heavy, as he shall see cause.

3. He will have a most plentifull provision for his childe, without any trouble to himself, or at all diverting his intentions, by only allowing the Steward one tenth part from time to time, as the reward of his care, skil, paines, and expence of his time, which must be chiefly dedicated to this service.

And here I present it more lively to your view in the following Table.

Years.	*Acres.*	*Charge.*	*increaſe.*
1	3	9	30
2	6	18	60
3	9	27	90
4	18	54	180
5	42	126	420
6	102	306	1020
7	291	582	2910
For all	29100	58200	291000

Deductions for the Poor.	*Maintainance of your child.*	*Return of your firſt ſumme.*	*Remains.*
3	7	0	20
6	14	10	30
9	21	00	60
18	22	00	140
42	38	00	340
102	48	00	970
291	59	00	2560
29100	5900	00	256000

By this time you may perceive that the Steward did the laſt year manage 29100 Acres, which is full enough, and therefore he cannot well goe further this way.

By this time you may perceive, that every Engager hath benefited the poor 471 *l.* and by all together, the poor are relieved with 47100 *l.* A bleſſed deed it is, and your reward follows it cloſe at the heels, for all your children are made richer by 256000 *l.* and every particular child hath a portion raiſed of 2560 *l.* and all parties are well contented, ſince your Steward alſo muſt acknowledge himſelf well payd: Inſomuch that if any his good Maſters ſhall deſire to have all, or part of the ſaid ſtocks longer to remain in his hands for a farther improvement; he will ſurely be willing to advance them in other waies to the beſt advantage: And by this means alſo ſome thouſands of working poor are provided for.

A Scale of the Charges of the Table formerly presented, with the Scale of some other Tables to demonstrate that advantageous Proposition.

SIR,

WHereas in the paper I presented to you yesterday, I have in a Table been bold to set down what I know to be very true, and as certain as most ordinary humane affairs, yet in regard I know also that the spirits of too many men (in this Age especially) are not only backward to attempt or incourage good actions, but are even ready to catch hold of any critical argument whereby they suppose they can blast an honest, rational, and advantageous Proposition, I thought it necessary to prevent all disputes of that nature by adding the following Table, and the Scales of Charge, by which either that or this is to be measured: And first the Scale of the Table formerly presented.

Rent for one Acre	00.13.04
Seed half a peck	00.00.06
First ploughing	00.02.06
Burning	00.05.00
Seed ploughing	00.03.04
Replanting and taking up	00.16.00
Re-ploughing	00.03.04
Cutting and thrashing	00.13.00
Fencing	00.07.00
	03.00.00

The Scale of the ſecond table, the charge of one Acre.

Rent	00.13.04
Seed half a peck	00.00.06
Firſt ploughing	00.02.06
Burning	00.05.00
Seed ploughing	00.03.04
Cutting and Thraſhing	00.12.04
Fencing	00.03.00
	02.00.00

The ſecond table now preſented, accompting but five pound per *Acre the Crop.*

Years.	*Acres.*	*Increaſe.*
1	4 *& a half*	22 *l.*10 *s.*
2	10	50
3	18	60
4	36	210
5	81	405
6	155	775
7	304	1220

Deducted for the Poor.	*Maintainance*	*Remainder.*
00	00	22 *l.* 10 *s.*
00	00	40 *and the* 10 *l. payd*
09	10	80
21	19	180
40	20	345
77	23	675
122	28	1070
26000	10000	347000

By

By this it appears that (valuing the Crop but at 5 *l.* *per* Acre, which no man can except againſt) each man will have his 10 *l.* repayed at the end of the ſecond year, and will out of onely 16 *s.* ſtock raiſe for his child a portion of 1000 *l.* and upwards, and for the relief of the Poor about 260 *l* and for the preſent maintainance of his child (after the two firſt, and until the end of the ſeventh, 100 *l.*

And if men would but be ſenſible how certain (or at leaſt probable) it is that the firſt ſcale of charge will produce the return of 10 *l.* *per* acre, *per annum*, then men need venture their 10 *l.* but till the end of the firſt year onely, when it ſhould be returned, and yet their ſtock run up to the proportion diſcovered in the next Table, and alſo both the poor and their children receive good maintenance the ſecond Year.

The Third Table, valuing the crop at 10 l. per *Acre.*

Years.	*Acres.*	*Increaſe.*
1	3	30
2	6	26
3	12	100
4	27	270
5	43	430
6	111	1110
7	294	2940

Deducted for the Poor.	*For the Child.*	*Remains.*
0	00	20. *And the* 10 l. *Returned.*
6	14	40
12	18	90
27	13	240
43	17	370
111	19	980
294	26	2620
49300	10700	

By

By this it appears, that by onely ſparing 10 *l.* and that but for one year, you have purchaſed or provided for your Child as his Portion or Eſtate 2620 *l.* and for his preſent maintenance (after the firſt year, that is to ſay, for the other ſix by unequal proportions) 107 *l.* and the Poor are bettered by all this in the ſeven yeares by 493 *l.* from every particular Intereſt, and by the whole Stewardſhip, or hundred perſons or ſtocks by 49300 *l.* And all this is done in ſeven years, which any man may reaſonably hope (by the bleſſing of God) that he may live to ſee it effected.

If any man ask why this great advance here held forth is not followed hardly by any one man living? The anſwer is not far off (*viz.*) Few men do underſtand theſe wayes, fewer will give themſelves leave to caſt up their accompts for the future, or take care to put their endeavours for gain into ſo honeſt a method: For indeed (in a manner) all men are from their youth brought up either in idleneſſe and vanity, and by that meanes are utterly careleſſe of all wayes to thrive, and of the honeſteſt moſt; or if they be brought up to buſineſſe, they are ſo fixt before they come to a ripe underſtanding (ſuch as is able to diſtinguiſh and chooſe) that they neither will, nor well can winde themſelves out of their preſent Imployment or former Engagements. And indeed men are too generally poſſeſt with a too ſturdy diſlike of any thing how excellent ſoever, that is out of their common path, and by ſo much their diſlike thereto alſo increaſed by how much thoſe courſes propounded incline more to virtue.

But if all ſuch diſperſed ſpoaks and vallies were fixed in one Center (*viz.*) a faithfull, carefull, skilfull Steward) it might make ſuch a wheele as would be ever turning round in the right atchievement of an (even almoſt) infinite and endleſſe proſperity.

Farewel.

A Propoſition concerning Rape-ſeed, wherein the charge is ſet down with the moſt, the return with the leaſt, but both in the common way.

	l. s. d.
ONe Acre of Marſh land fit for Rape may be taken for	00.13.04
May be ploughed the firſt time for	00.03.04
May be burned for	00.06.08
Will be ſowed with half a peck of ſeed worth	00.00.09
May be ploughed the ſecond time for ſeeding for	00.04.08
May be fenced for	00.04.03
May be reaped for	00.10.00
May be thraſhed for	00.07.00
The whole charge of an Acre is	02.10.00

If God pleaſe to ſend but the ordinary bleſſing upon this, there cannot be leſſe than five Quarters; but it is not unuſual to have ſix, ſeven, eight, nine, or ſometimes ten Quarters upon one Acre.

	l. s. d.
One Quarter of good Rape ſeed is worth alwaies, and at leaſt four and twenty ſhillings, and ſo the leaſt return of one Acre, five Quarters is worth	06.00.00
The Straw may be worth, though it be but to burn,	00.03.04
The whole profit is	06.03.04
From this deduct the charge	02.10.00
There remains as clearly gained	03.13.04

Whoſoever engages twelve pound, gains	14.13.04
Whoſoever engages four and twenty, gains	29.06.08
Whoſoever engages thirty, gains	36.13.04
Whoſoever engages threeſcore, gains	73.06.08
Whoſoever engages a hundred, gains	124.13.04

It appears that he that engageth deepeſt hath the advantage, and that all mens moneys is more than doubled, and all

all this in the common way, which I ſhall endeavour to make much better by the bleſſing of God.

If any ask why an Engagement of twelve pound in ſtead of ten is deſired, it is for the reward or ſubſiſtance of the Steward of the work, who after the firſt year, and when engagements are become deeper will accept one tenth part in the beginning of each year, of the ſtock for his charges and pains, and at the end of the year one tenth part of the Increaſe for the reward of his care and skill, or come to a certainty of profit to the Engager, and himſelf have no other reward but the overplus when they are ſatisfied, be it more or leſſe, as God ſhall bleſſe his endeavours. If any man doubt of the truth of this, let him reſolve himſelf by a free and ingenious enquiry of ſuch as have dealt in this commodity.

A Propoſition for ſowing of Hemp, whereby alſo a way is ſhown to ſet moſt of the preſent Poor to work without prejudice or oppreſsion, or altering any Law already eſtabliſhed.

FOr the more general ſorts of Poor, I humbly conceive that what followeth may be a good way, and open to them a door of ſubſiſtence, without wrong or loſſe either of wealth or freedom to any ſubject of *England*, ſince in it all things are to be done in love and order; the Rich invited by the Profit, and the poor comming in as to a ſafe harbour, where he may reſt ſecure under the Lee of this opportunity from the dangerous working of thoſe many and ſtrong tentations their poverty is accompanied with, and from the danger of the ſevere proſecution of the known Laws againſt Idleneſſe, which will become altogether good, if all pretence or excuſe be thus taken away, and the perſon once taken notice of, be uncapable of any ſecond forbearance.

I ſay then that ſowing Hemp is the moſt certain way, how with gaines to all parts many hands may be ſet to work, but if any man think Flax better, he may uſe it; yet I muſt tell you that Flax (as ſometimes it turnes to greater profit than Hemp, ſo it) is not ſo certain; and after Flax the ground is not ſo right for Corn as after Hemp, which indeed prepares land excellently for Corn; but the chief reaſon is, that the perſons to be employed are more likely to do good (at firſt eſpecially) on Hemp than Flax, the other being the more choice and difficult work, in all points requiring more care and skil, and the vent for Flax alſo is nothing ſo ready as that of Hemp, the uſes being not ſo many, nor ſo great, and we may equal the works of other Nations in Hemp, not preſently in Flax.

If there will appear a hundred honeſt, able, worthy Engliſhmen, that will engage each man ſix thouſand pound to ſet forward this good work (or if not juſt ſo, yet more men and leſſe ſtocks amounting to that proportion (*viz.*) of ſtock engaged in all ſix hundred thouſand pound; I ſhall onely hold forth the private and publique Advantages, and may boldly promiſe them, beſides Gods bleſſing, and their Countries love, together with the conveniency of taking the moſt ſafe courſe (one of them at leaſt) that can be imagined in theſe times.

The ſix hundred thouſand pound, will ſow about threeſcore thouſand Acres, and defray all charges firſt and laſt till the Hemp be converted into Cordage, Cloth, &c. and fit for ſale. That is, ten pound for an Acre, and each Acre will ſet above two hundred perſons to work for one day; the whole will ſet above forty thouſand to work all the year. Every Acre well managed will yeeld at leaſt twenty buſhels of ſeed, which at two ſhillings the buſhel, is forty ſhillings the Acre, or a hundred and twenty thouſand pound for the whole, and each Acre ſo managed may yeeld at leaſt five hundred and ſixty pound of Cloth or Cordage, worth one with another five pence the pound, in all for one Acre ſixteen pound ſterling, and in all for the grand ſtock nine hundred and ſixty

thouſand pound ſterling; by which, three hundred and ſixty thouſand pound is gained, that is, about fourteen ſhillings in the pound gained yearly. And for two years after, the ſame ground will bear moſt excellent Wheat, Rye, or Barley, all charges payed to the value of four Quarters of Barley on an Acre, worth one time with another twenty ſhillings a Quarter, in al a hundred and twenty thouſand Quarters, and ſo alſo a hundred and twenty thouſand pound yearly.

Thus ſhall forty thouſand Poor be kept conſtantly at work all the year, and the Commonwealth eaſed of that burthen, and advantaged beſides a hundred and fifty thouſand Quarters of Hemp-ſeed, a hundred and fity thouſand tun of Cloth and Cordage, and above a hundred and twenty thouſand Quarters of good Corn; and the Undertakers amongſt them ſhall gain clearly three hundred and ſixty thouſand pound ſterling yearly. This is ſet down purpoſely, the Charge with the moſt, and the Return with the leaſt. And if the number of ſo many Rich men cannot be found to engage for any of theſe ſums, more perſons, and leſſe engagements may begin the work.

An Anſwer to five Queres or Objections againſt the Propoſition for ſetting the Poor to work upon Hemp growing, or to be growing in England.

Qu. 1. *Whether thoſe in* France, *&c. practiſing this way, do make the Gaines here ſuppoſed, all Caſualties conſidered?*

Anſw. Whether they in *France*, &c. doe make ſo great, or greater profit, I cannot tell, as having never been there to ſee, but 'tis probable they doe equal this, if their ground be equal, (as ſome will have it) ſuperiour to ours in fertility, and fitneſſe for this weed.

Qu. 2. *Whether we can ſpare the land here in* England? *or whether it is not already imployed to more benefit?*

Anſw. To this I can better anſwer, as the thing I pretty wel

well know, that the Land may not onely be ſpared, but will otherwiſe very much enrich us, and advance our plenty of Corn, and this is declared in the Propoſition, and the Queſtion therefore not ſo pertinent: Yet for a farther Anſwer, I affirm, that there is demonſtratively in *England* and *Wales* above 4000000 of Acres for Tillage, and you finde but forty thouſand Acres to be uſed yearly for the ſowing of Hemp, which is but the hundereth part, and it is there promiſed, that in the two or three ſucceeding years wherein the ſame land ſhall be ſowed with Corn, amends ſhall be fully made for the miſſing of that yeares crop, and more by the goodneſſe of thoſe that follow.

The laſt part of this Quere is ſoon anſwered; for it is generally known, that an Acre of Corn (taking one time, place, grain with another throughout) is hardly worth forty ſhillings, whereas a reaſonable Acre of Hemp is worth (ſtanding four pound, ſome five pound, ſome ſix pound, and very many more. And then the Acre of Corn is worth no more than it ſhews for, whereas the Hemp (to the Commonwealth as well as the particular owner) is of far greater value, if we conſider that one Acre of Hemp well wrought up may be worth above a hundred pound, but then the charge may amount to the better half indeed.

Qu. 3. *Whether by the inexperience of the people of this Land, other Nations will not very much under-ſell us?*

Anſw. I could as well have propounded Flax as Hemp, ſince in many caſes and places it is more uſefull and profitable, but I onely name it in the Propoſition, and if you obſerve the reaſon there given for ſo doing, you will find much of this Queſtion anſwered or prevented. But how far other Nations may under-ſell us, or we them, I leave to the judgment of thoſe that are more Merchant-like, to which I lay no claim, but (at moſt) pretend to be one that would fain be a good Inland Husband, a Lover of my Country, and a faithful ſeeker of her Peace & Proſperity by all juſt and lawful means. Yet thus much I can ſay to the point, that to my know ledge many hundreds (I think I may ſay thouſands) of Acres are

with great advantage to the poſſeſſors imployed in this way, namely in the Iſle of *Axholm*, and other the parts of *Lincolnſh. &c.* which place is more populous than any part of *England* that I know, and yet few or no Beggars. And I have a little lookt into the prizes, yet I find not Engliſh hemp differ much in price from that which is imported; it ſeems to me that neceſſity rather (as not having enough at home) cauſes ſuch importing. I have ſeen a *Hull* Merchant ſtand upon three pence a pound for raw Hemp, when the ſame day Engliſh Hemp, that was adjudged every whit as good, was ſold for two pence half penny. I have alſo known Hemp fetched by Waggon from *Bourn* in *Lincolnſhire*, to *Gloceſter* upon the River of *Severn*. And for our Experience, certainly we may bluſh to ſay we have not ſufficient skill to make Cordage, or ſuch kinds of coarſe cloath as the Propoſition intends; namely, ſuch as is commonly uſed to make Sheets, Table-cloathes, Towels, Napkins, and the coarſer ſorts of Shirting, or the like: As for the finer ſorts, we may work our ſelves into the kill and practice of making ſuch by degrees, and at more leaſure.

Qu. 4. *Whether when we make ſo much Linnen Cordage as here, we ſhall have ſo good vent for our Native commodities for which Cordage, Hemp, &c. is returned?*

Anſw. As I ſaid, I pretend not to judge of Merchants affairs, yet I have not heard of any of our native commodities which are vented for Hemp, or Cordage or the like, which will not be acceptable to the ſame or other Countries for the return of as good commodities. Once I am ſure, that thoſe commodities are onely (or at leaſt moſt) fit to import which we cannot ſo well make native to us, as Spices, Wines, Drugs Medicinal, Silkes, *&c.* And I ſuppoſe it cannot be unhappy, or unfit for us to make as many our own as by good meanes we can, eſpecially, Hemp, Cordage, *&c.* ſince we cannot be without them, and are not ſure alwaies to hold fair correſpondence with thoſe Nations from whom we have them, the chief ſtrength of *England* principally conſiſting in Shipping, 'tis but a coarſe policy to have our Cordage, *&c.* to keep.

Qu. 5.

Qu. 5. *Who will advance ſo great a ſumme in unſetled times upon a New Trade, having in it the afore-mentioned (and perhaps more) difficulties?*

Anſw. If you pleaſe to obſerve my Propoſition, you will find, I ſay onely if ſuch men may be found, I promiſe not to find them, but if they will finde themſelves I hold forth to them the ſweet invitation of a greater advantage than, I beleeve they can otherwiſe obtain by direct and good means: And then adde to that the double and treble ſervice or good they ſhall (all under one) do tax for their Chriſtian Brethren and native Country. And if this will not invite, cannot perſwade them, yet me-thinks we ſhould rather take occaſion to bewaile our own, theirs, and the Commonwealths miſery and averſneſſe from all goodneſſe. As for the troubleſomneſſe of the times, I can but put you in mind of that part of the Propoſition that aſſures this to be one of the moſt ſafe and likely waies to ſave a mans eſtate, where if it be not fully enough explained, I refer you to your own better judgement to find and propound what you think beſt.

And now whoſoevet raiſed theſe Objections, did well, if he did it for the right end (*viz.*) to illuſtrate the Propoſition, that ſo it might be made more clear and acceptable. But its too common to object as an enemy, not to demonſtrate, but deſtroy deſignes in themſelves not evill, at leaſt well intended.

A new Husbandry, or Improvement of Rape-ſeed.

IN the way of a Merchant I doe not certainly know, but can gueſſe how to diſpoſe of great quantities of Rape-ſeed, but for Hemp ſeed I confeſſe I am ignorant how to vent any ſuch great quantities; but if I may be ſhewed a way to vent either, particularly the laſt, I may poſſibly propound a way to produce a much greater encreaſe than is uſually had of either, as namely, whereas it is now the uſual cuſtome to ſow Rape-ſeed in low lands, and Fenny, Mooriſh Countries, where it is lyable to the breakings in of the Sea, or overflow of

Land-floods, I can as well, and with as much hope of a plentifull return and encreaſe, ſow it in any good upland not lyable to ſuch caſualties, and for the profit more certain, which at preſent is in the aforeſaid Lowlands when it ſcapes thoſe floods, valued at five pound *per* Acre. I ſay I can propound a way how each Acre of ſuch rich Upland ſhall yeeld at leaſt a Laſt or ten Quarters, or eighty Buſhels, which at but three ſhillings a Buſhel, the cheapeſt rate, is twelve pound ſterling, and for extraordinary charge I will deduct forty ſhillings more than the common way requires *per* Acre, ſo that one Acre ſhall be as good as two now and fixt, that is, the profit much more certain.

And for Hemp, I ſay, that whereas an Acre of good Hemp may now be ſold ſtanding for about ſix pound, and the very beſt under ten, ſeed and all. I can propound a way, by taking of which, each Acre ſhall be worth, all charges defray'd, at leaſt ſix pound, thirteen ſhillings, four pence for the tew onely, and at leaſt ſix pound, thirteen ſhillings and four pence more for the ſeed; and both theſe productions are made by the careful and skilfull replanting of the hearbs, and choice and manage of the grounds.

A Paſſage taken out of a tract againſt the high rate of Uſury; preſented to the high Court of Parliament, Anno Domini 1623. *In which the Uſe for Money was brought down from ten to eight in the Hundred. And now humbly recommended to a further Publique Conſideration, as a ſpecial Means for Advancement of the National Husbandry of this Commonwealth.*

IT hath been the wiſdom and care of former Parliament to provide for the preſervation of Wood and Timber; for which there is nothing more available than the calling down of

of the high rate of Uſury; for as the rate of Money now goeth, no man can let his Timber ſtand, nor his Wood grow to ſuch years growth as is beſt for the Commonwealth, but it will be very loſſe-full to him. The ſtock of the Woods after they are worth forty or fifty the ſhillings the Acre, growing faſter at ten in the hundred than the Woods themſelves doe. And for Shipping, which is the ſtrength and ſafety of this land, I have heard divers Merchants of good credit ſay, that if they would build a Ship, and let it to any other to employ, they cannot make of their Mony that way, counting all charges, tear and wear, above ten or twelve in the hundred, which can be no gainful Trade without hazard, Money it ſelf going *at ten* in the hundred. But in the Low-Countries where Mony goeth at *ſix*, the building of Ships, and hiring them to others, is a gainfull Trade, and ſo the ſtock of Rich men, and the induſtry of beginners are well joyned for the publike.

And yet that which is above all the reſt, the greateſt ſin againſt the Land is, that it makes the Land it ſelf of ſmall value, nearer the rate of new found Lands than of any other Countrey, where Laws, Government, and Peace have ſo long flouriſhed: For the high rate of Uſury makes Land ſell ſo cheap, and the cheap ſale of Land is the cauſe why men ſeek no more by induſtry and coſt to improve them; and this is plain both by example and demonſtration; for we ſee in other Countries, where the uſe of Money is of a low rate, Lands are generally ſold for 30,40, in ſome for 50 years purchaſe. And we know by the rule of bargaining, that if the rate of uſe were not greater here than in other Countries, Lands were then as good a pennyworth, at twenty years purchaſe as they are now at ſixteen: For Lands being the beſt aſſurance, and ſecureſt inheritance, will bear a rate above Money. Now if Lands were at thirty yeares purchaſe, or near it, there were no ſo cheap purchaſe, as the amendment of our own Lands; for it would be much cheaper to make one Acre of Land, now worth five ſhillings by the year, to be worth ten ſhillings, or being worth ten, to be worth twenty

twenty ſhillings; and ſo in proportion, then to purchaſe another acre worth five or ten ſhillings. And in every acre thus purchaſed to the owner by the amendment of his own, there were another purchaſed to the Commonwealth. And it is the bleſſing of God to this Land, that there are few places of it to which he hath not given means by reaſonable coſt and induſtry, greatly to amend it, in many to double the value, ſo as in time, if for their own good, mens induſtry were compelled that way, the riches and commodities of this Land would neer be doubled: Then would all the wet-lands in this Kingdome ſoon be drained, the barren lands mended by Matle, Sleech, Lime, Chalk, Sea-ſand, and other means, which for their profit mens induſtry would find out. We ſee with how great induſtry and charge our neighbours the *Dutch* do drain and maintain their Lands againſt the Sea which floweth higher above them than it doth above the loweſt parts of our drowned lands. I will admit a great deal to their induſtry, but I ſhould very unwillingly grant that they are ſo much more ingenious and induſtrious than we, as that all the odds were therein. Certainly the main cauſe of it is, that with us money is dear and land cheap; with them lands dear and money cheap; and conſequently the improvement of their lands at ſo great a charge with them, is gainfull to the owners, which with us would be loſſe-full; for Uſuring going at *ten in the hundred*, if a man borrow five pounds, and beſtow it on an Acre of ground, the amendment ſtands him in ten ſhillings a year, and being amended the Land is not worth above fifteen years purchaſe: But if the uſe of money went at no more than at other places, then five pound beſtowed upon an Acre of ground, would ſtand a man in but five or ſix ſhillings a year, and the acre of land ſo amended would be worth, as hath been ſhewed, ſix and twenty or thirty yeares purchaſe. Whereby it appeareth, that as the rate of Uſe now goeth, no man (but where the land lyeth extraordinarily happy for it) can amend his Land but to his own loſſe; whereas if money were let as it is in other Countries, he might beſtow more than double as much as now he may, and

yet

yet be a great gainer thereby; and consequently, as was before remembred, should to his own benefit purchase land to the Common-wealth.

Neither would such purchase of Land to the Common-wealth be the benefit to the landed men onely, the benefit would be as much to the poor Labourers of the Land: For now when Corn and other fruits of the land which grow by labour are cheap, the Plough and Mattock are cast into the hedge, there is little work for poor men, and that at a low rate, whereas if the mendment of their own lands were the cheapest purchase to the owner; if there were many more people than there are, they should be readily set a work at better rates than now they are, and none that had their health and limbs could be poor, but by their extreamest lazinesse.

A Bank of Lands; or, an Improvement of Lands, never thought on in former Ages: Begun to be presented upon most rationable and demonstrable grounds by Mr. William Potter *(a Gentleman of great deserts, and of a most Publique Spirit) which being more fully cleared in all its Particulars, and established by publique Authority, may become a standing and setled Meanes to enrich the whole Nation, and also to remove Taxes, and other publique Burdens.*

THrough the long continuance of the Wars, Trade hath been interrupted, great losses sustained at sea, the people constrained to live upon the main stock, mens credits ruined, many debts (otherwise good) lost, both friends and enemies plundered or sequestred, and Taxes, *&c.* unavoydably continued, whereby the Nation is now in a very low condition.

There is a great necessity that this Epidemical disease of

ruin in mens eſtates ſhould be cured; for hereby,

1. The Rich, that ſhould ſupport others, are diminiſhed in number, and weakned in means, and the Poor that ſhould be upheld, are increaſed both in number and neceſſities.

2. If the removing of Burdens be neceſſary, the removing of Poverty (without which the reſt are, in effect, no burdens) is more neceſſary.

3. The Trade, Manufacture, Shipping, Strength, Repute and flouriſhing eſtate of the Nation, depends as the meanes upon the Riches thereof.

4. The ſervility of a low condition, deprives men of much leiſure and freedom in attending higher things.

This burden may be removed by encouraging ſuch employments and undertakings as tend to increaſe the eſtates of ſome without impoveriſhing others; for whatſoever takes from one mans eſtate as much as it adds to another, doth not inrich the Nation.

The capacity of inriching this Nation, is in a ſort infinite.

1. By making it the Scale of Trade to other people, which conſiſts in buying the commodities of other Countries, working them here, and ſelling them again in forraign parts: Whereby if *England* were a City upon a Rock (and held no land of their own) they might be maintained comfortably. Witneſſe *Holland*.

2. By Plantations throughout the world, which tends to leſſen our charge, and increaſe our means, by the returnes of commodities out of the induſtry of thoſe that otherwiſe muſt be maintained for nothing.

3. By the Fiſhing-trade, wherein the Sea affords a vaſt Treaſure, without demanding any rent for it, all which three laſt particulars would yeeld a kind of infinite of increaſe, if there were no want of ſtock to employ therein.

4. By improving our preſent Poſſeſſions: For,

1. Almoſt all the Land in *England* might be made to yeeld much more encreaſe, if men had money to imploy in manuring the ſame.

2. Divers

2. Divers Husbandmen want wherewith to ſtock their ground, whereby (perhaps) the Nation ſuffers more than many times by much unſeaſonable weather.

3. A great part of *Ireland* lyes at preſent waſte, which (without great ſtock to plant) is like ſo to continue.

4. There are great quantities of oazie grounds about the Sea-coaſt and other Fens and waſte grounds; beſides Forreſts and Commons, which drained and improved might equalize in value ſome two or three Counties in *England*.

5. There are many Mines in *England*, *Ireland*, and *Scotland*, which being wrought would much increaſe our Exportation and imployment for poor men.

To ſet all theſe Wheels a going, two things are neceſſary, *viz.* that the people may know where to be furniſhed with ſtock at low intereſt, and that a ſufficient quantity of currant money be diſperced amongſt them.

And indeed the great *Remora* is, that the people are generally voyd of ſtock, whereby it is impoſſible they ſhould deal either in the Forraign Trade, Fiſhing, Plantations, or Improving their own poſſeſſions, by reaſon whereof both poor and rich are deprived of imployment, and forced to live chiefly upon the Principal, to the greater increaſe of their poverty and ruin.

Whereas if they knew where to obtain ſuch ſtock at low Intereſt, it would both enable them to proſecute the aforeſaid ends, and alſo make way for the more ſpeedy vent of commodities in other Nations; for greatneſſe of ſtock at low Intereſt, would enable the Engliſh Merchants to deal for much, and thereby to buy cheap, work cheap, and ſel for leſſe profit in the pound (and alſo to procure their commodities at the beſt hand, *viz.* at the places of their growth in their proper ſeaſon) whereby out-trading and underſelling other Nations, they obtain the pre-emption of ſale, and ſo cannot fail of vent abroad.

Alſo great ſtock at low Intereſt would enable Merchants to raiſe the price of our own native commodities in Forraign parts, by keeping them for a good Market, which helps

much towards the enriching of a Nation.

Again if there were great quantity of money diſperced amongſt the people of this land, there would not want vent of commodities amongſt themſelves.

For in this caſe every man to improve his ſtock would be laying out that mony in commodities, & thoſe that receive it would be laying it out again upon others, and thoſe upon others, and ſo on, which would beget a conſtant return, or quick vent for commodities proportionable to the quantity of money ſo perpetually revolving amongſt them.

Now if (through plenty of mony amongſt the people) there were as much vent for commodity as the earth could by induſtry be made to afford, men would not ſpare either the Sea or the Land, but the one by the Fiſhing Trade, the other by Husbandry and all ingenious wayes of Improvement here in *England*; by planting in *Ireland*, and other new Plantations throughout the whole Globe, would beſtow all their skill and diligence to multiply commodity and livelyhood to the imployment of innumerable poor, and all other men whatſoever, and the abundant increaſe of our Shipping and Dominion on the Sea, and thereby the ſtrength, renown, and flouriſhing eſtate of the Nation.

And not onely ſo, but if there were ſuch vent here in *England*, even Forraign Nations would diſpatch their commodities hither as to the quickeſt Market, and by meeting here (as in a center) might furniſh each other with returns, ſo as *England* would become as it were a general Market or Faire to other Nations, to the great enriching thereof; whereby the Frontier Towns upon the Sea-coaſt, by reaſon of Trade would grow populous and ſtrong for the defence of the Nation.

Alſo quickneſſe of returns here in *England* would expedite returns abroad; for quick returns makes a ſmall ſtock equivalent to a great ſtock with ſlow returns, and therefore if the Merchants of *England* could vent all ſorts of commodities here as faſt as they could poſſibly procure them, it would inable them to deal for much, and conſequently to buy much cheap,

cheap, work cheap, and ſell for leſſe profit in the pound as before. So as in this caſe there would not want vent for commodities, either at home, by reaſon of the plenty of mony here, or abroad by reaſon of our own out-trading other Nations, through the greatneſſe of our ſtock, and quickneſſe of returns.

Alſo if men (through plenty of Coyn revolving amongſt them) could meet with ready money for all commodities as faſt as they could be made fit for ſale, no man for the future would deal for time, the rather for that the forbearance of Debts in a time of quick trade would be great loſſe.

This would remove all thoſe Inconveniencies which are incident to the ordinary way of Trading upon credit, *viz.*

1. The impriſonment of mens perſons for debt.
2. Innumerable ſuits of Law about ſuch debts.
3. Much trouble in keeping Accompts.
4. Great loſſes by mens truſting thoſe that fail.
5. Couſenage in thoſe who (concealing their eſtates) compound with their Creditors.
6. Underſelling the Market for procuring money to pay debts.
7. Hard bargains by taking up ware upon truſt.
8. Diſabling men from managing their Trade, and taking the advantage of the Market, their ſtock being in other mens hands.

This neceſſity of plenty of Coyn amongſt a people, is the reaſon why States makes Laws againſt the Exportation thereof, and many times pitch upon ſome Staple commodities which they will not exchange with other Nations but for returns in Bullion.

So much money in *ſpecie* as were neceſſary to furniſh the people with the aforeſaid ſtock at low Intereſt, and ſuch plenty of Coyn as is already mentioned, is impoſſible to be had, and if it could be obtained by returnes from other Nations, yet we muſt part with our own commodities for it, which we cannot ſpare in ſuch great quantities. Whereas upon ſerious conſideration it will be found, that Credit ground-

ed upon the beſt ſecurity is the ſame thing with Money, and may be had in very great abundance, without parting with any commodity for it.

That ſuch Credit is as good as Money will appear if it be obſerved that Money it ſelf is nothing elſe but a kind of ſecuritie which men receive upon parting with their commodities, as a ground of hope or aſſurance that they ſhall be repayed in ſome other commoditie: ſince no man would ſell any commoditie for the beſt money, but in hopes thereby to procure ſome other commodity or neceſſary.

True it is that Coyn which hath no intrinſical value, as they call it (*viz.* Money of Braſſe, Copper, *&c.*) though whilſt it runs currant the owner may obtain commodity for it, yet when the uſe of it is prohibited (no man being engaged to make it good) he ſuffers loſſe. Which if he had ſecurity in Lands of ſufficient value would be prevented, whereby it appeares, that ſecurity anſwers to the intrinſick value of Coyn.

That ſuch Credit is as good as Money. is alſo evident upon this ground, That Money if it were a better ſecurity than it is, yet it ſerveth onely to ſupply the interval of time between the ſelling of one commodity, and the buying of another: Now the beſt aſſurances in Land are a ſecurity ſufficient for the ſupplying of that intervall: Eſpecially conſidering that mens eſtates are generally either in land or commodities. And in land (though more certain than commodity) yet if abſolutely purchaſed there may be loſſe by its decreaſe in value, but if accepted onely as in Morgage, that hazard is prevented, and ſo becomes the moſt certain ſecurity on earth, and therefore muſt needs be ſufficient to ſupply the ſhort interval betwixt the ſelling of land or commodity and the buying thereof.

Upon this ground that Security is in effect the ſame thing with Money, it is, that in divers places of the world it runs currant in ſtead of Money.

This Bills in *Flanders* obliging the Debtor to pay money at

at a certain time, are acccepted by thoſe who eſteem of the man as able and ſufficient, whereby ſuch Bills doe uſually paſſe from one hand to another, untill they become payable.

Thus in *Venice*, *Leighorn*, and *Amſterdam*, the ſecurity (commonly called Credit, grounded upon the depoſitions of money in bank, runs currant, and though the owners may have mony if they pleaſe, yet they chuſe rather to deale by credit; whereby it appeares that it is neither unpoſſible, ſtrange, nor unpracticeable, for ſecurity to be made to ſupply the place of mony.

This is beſt effected by the way of Banks.

Banks, as they are now practiced, are nothing elſe in effect but places where men pawn or depoſite their moneys for obtaining currant credit, as that which they may keep with leſſe danger, and aſſign to another with leſſe trouble.

If any man who hath credit in Bank demands the money, it is payd him; but as ſome men demand money out of the Bank, ſo others when they are to receive money, doe cauſe it to be payd into the Bank, whereby to eaſe themſelves of the trouble of receiving, keeping, and paying it.

Hence it is that the Bankers are alwaies receiving mony of ſome, as well as paying it to others; ſo as thoſe who from time to time demand any money, are uſually payd by thoſe who bring it in, and the reſt of the money lyes dead in bank, or elſe that Bank hath no credit; for look how much credit runs currant, ſo much monry doth or ſhould lye dead in bank, as a pawn for making good theeof.

Now ſeeing ſuch money lyes dead in bank, and ſerveth for no other purpoſe, but as a pawn or ground of ſecurity; for making good the credit that runs currant in ſtead thereof, there is no doubt to be made but that lands being morgaged to a Bank, would ſerve as well and better for ſuch a pawn, which cannot be removed or made away by force or fraud, as great ſummes of money lying long in one place may; neither is any temptation to an enemy, as Banks of money are; witneſſe the late attempt of the Prince of *Orange*.

If

If any ſhould here expect a more full opening of the nature of ſuch Banks of ſecurity, and other circumſtances relating to the practice thereof, it is not my ſcope to inſiſt thereon at preſent, leaſt the diſcourſe might become too large for men of buſineſſe: It may ſuffice in the mean time that the thing it ſelf plainly appeares to be practiceable, there being nothing in it but what is dayly acted amongſt men: For,

1. The raiſing of Credit upon the ſecurity of Lands, is no new thing.

2. The making uſe of Credit in Bank, inſtead of mony, and transferring of ſuch credit from one man to another in books kept for that purpoſe, is alſo practiſed in the aforeſaid Banks. Now put thoſe two together, and you have the whole of what is here propounded.

I ſhall therefore in the generall put a caſe.

Suppoſe any company of men ſhould proffer to lend this State two or three hundred millions of mony *gratis*, let us conſider what they would do therewith.

They could not imploy it with ſafety any otherwiſe, then by lending it forth to the people upon ſufficient ſecurity at a reaſonable Intereſt, becauſe it is but lent to them, and therefore muſt be reſtored.

2. It may be they would reſolve alſo to raiſe Banks therewith, whereby the credit grounded upon ſuch mony, might run currant amongſt the people, rather than the mony it ſelf, which is not ſo fit for daily uſe, in great ſummes, in reſpect of the trouble of telling and re-telling, the loſſe in clipped and counterfeit mony, the hazard which men ſuſtain in keeping much mony by them, the trouble of carrying great ſums from houſe to houſe, and the danger from conveighing it in *ſpecie* from one Town to another, whereas dealing in ſuch credit (as to all great ſummes) would prevent Highway-theeves, who if they have nothing but goods to ſeize upon in the road, cannot goe long undiſcovered, nor can advance any thing thereupon worth their attendance, which would totally diſcourage them from following that lewd kinde of life, and thereby free the Highwayes of ſuch Vermine.

Credit

Credit alſo is better amongſt the people than money, in theſe two reſpects : Firſt it cannot be tranſported to other Nations. Secondly, it will not be hoarded up, as mony many times is to the great hinderance of Trade : for that money which is of leaſt eſteem amongſt the people, if it be of real value in it ſelf, is moſt for their good, becauſe every man ſtriving to poſt it off from himſelf, doth thereby quicken returns of Trade.

Now ſuppoſe that (upon theſe manifold conſiderations) ſuch Banks ſhould be erected, and it ſhould thereupon come to paſſe, that this mony thus lent to the Commonwealth, ſhould lye dead in Bank, and the people ſhould make uſe of their Credit in ſtead thereof (as they do I ſay in other places) I demand then to what purpoſe this mony ſerveth ?

If it be ſaid it lyes for a pawn to ſecure the Credit that runs currant in ſtead thereof :

I anſwer, the Land which was taken for ſecurity, when the money was lent to the people, is a ſufficient pawn to make good ſuch credit : If not, then the money which was lent upon that ſecurity, which fails, is loſt ; but if the ſecurity hold good it is the ſame with money : And therefore if the State might venture to lend the money it ſelf upon the beſt ſecurity, the people may even as well venture to take ſuch ſecurity it ſelf for money.

Hereupon there is no doubt but the State (in order to their own ſecurity) would reſtore this money to the owners, and proceed without it, as being, firſt, altogether ſuperfluous ; ſecondly, a great temptation to an Enemy ; thirdly, ſubject in proceſſe of time to the fraud of Officers, and ſudden commotions of ſeveral parties and factions if it lye dead in Bank : And if it goe abroad, then not ſo fit for daily uſe of Credit in the manifold reſpects already mentioned : And if they thus proceed without the ſaid mony they doe the ſame thing which is here propoſed.

The premiſes conſidered, to diſpute againſt the aforeſaid Banks grounded upon ſecurity, is the ſame thing, as to oppoſe the accepting of the aforeſaid mony in *ſpecie*, if it were to be lent this Nation *gratis*.

This being ſo, if any ſhould ask whether the State would refuſe the free loan of ſo much ready mony? I anſwer (confidently) No.

1. Becauſe by the lending thereof to the people upon Intereſt, a Revenue may be raiſed to free them from publique taxes and burdens.

2. Intereſt might be brought to a low rate for the incouragement of Trade, and without any compulſive Law.

3. The filling of the land with ſo exceeding great a quantity of money, would by the revolution thereof quicken Trade in the higheſt degree.

4. It would be a means to furniſh the people with abundance of ſtock to employ in the Forraign Trade, Fiſhing, Plantations, improving their own Lands, drowned and waſted grounds, Mines, *&c.* in all the three Nations.

5. By ſuch fall of Intereſt, Land would riſe much in price, which (beſides the help of ſufficient ſtock and quick vent) would much incourage the improvement thereof.

6. Many publique Grievances and Burdens would be prevented thereby (as is already for the moſt part obſerved) *viz.* oppreſſion amongſt Broakers and Extortioners; the trouble, charge, and hazard in returns of moneys, Highway-theeves, impriſonment for debt, innumerable law-ſuits, loſſes by failers, underſelling the Market, enhancing forraign commodities, and debaſing the value of our own: And in brief, that great Burden of all Burdens, namely, extream Poverty, with divers other particulars, which I ſhall not further repeat.

Now conſidering our preſent great extremities for want of ſtock and mony, who that loves his Country, would be againſt the accepting of ſuch an immenſe Treaſure of good and currant Coyn, if it were proffered this Nation *gratis*; and yet it plainly appeares by the premiſes, that all this Treaſure lyes within our own reach, in that kind of Bullion, which is better than mony in *ſpecie*, and wants nothing but the meer ſtamp of Authority to make it currant; and hath this further advantage in it, that it may be made uſe of to the worlds end, without fearing it ſhould ever be demanded, which ſo much mony lent, *gratis*, cannot.

To

To conclude therefore, it plainly appears that the way to remove Poverty, Taxes, and moſt publique Grievances, and to make this Nation abound in Wealth, Trade, Cities, Shipping, People, and Renown, is (according to means) neither unpracticeable, nor difficult, except we renounce all humane prudence, and with the Sluggard in the *Proverbs*, create difficulties to our ſelves, where God hath made none.

If therefore the Propoſition in general be thought worthy of regard, it is humbly deſired that Commiſſioners might be appointed to hear and debate ſuch conſiderations as relate thereunto, with that ſeriouſneſſe as a thing of this moment will require; for upon the meer reading of things, men ſtart many ſcruples (through miſapprehenſion) which have no ground but their own miſtakes; whereby many good Propoſals ſuffer great prejudice, which upon ſolemn debates would be eaſily detected and prevented.

By this means theſe Propoſitions have been already clogged by divers that have heard thereof, at the ſecond and third hand, with ſeveral falſe Imputations and groundleſſe Jealouſies; all which if thoſe that are concerned, will pleaſe to make it their buſineſſe to be ſatisfied, will, I hope, be fully be cleared.

Thus far of the Bank of Lands at the preſent.

The Concluſion of the Legacie of Husbandry, taken out of Sir R. Weſton *late of* Sutton *in the Countie of* Surrey, *his Legacie to his Sons, with a little alteration of his words.*

BY the means of good Husbandry you may nobly augment your eſtates, and will receive ſo much the more profit and praiſe, by how much more induſtry and diligence you govern your affairs; and will not only be imitated, but alſo honoured by our Neighbours, when they ſhall ſee your labours proſper ſo far, as to convert barren ground left unhusbanded for many Ages into commodious Arable land, with Paſtures and Meadows. And certainly that man is worthy of praiſe and honour, who being poſſeſſed of a large and barren Demeaſne, conſtrains it by his labour and induſtry to produce extraordinary fruits; which redounds not onely to his own particular profit, but alſo to the publique benefit. *Cato* ſaith, *It is a great ſhame to a man not to leave his Inheritance greater to his Succeſſors than he received it from his Predeceſſors, and that he deſpiſeth the liberality of God who by his ſlothfulneſs loſeth that which his Land may bring forth, as not ſeeming willing to reap the fruits which God hath offered him.* Nay he threatens the crime of high Treaſon to thoſe that do not augment their Patrimony ſo much as the Increaſe ſurmounts the Principal. It is a thing much celebrated by Antiquity, and thought the nobleſt way to gather Wealth for to employ

employ ones Wit and Money upon his Land, and by that means to augment his eſtate. If you obſerve the common courſe of things, you will finde that Husbandry is the End which men of all eſtates in the world do point at. For to what purpoſe doe Souldiers, Scholars, Lawyers, Merchants, and men of all occupations and trades toyl and labour with great affection, but to get money? and with that money, when they have gotten it but to purchaſe Land? and to what end do they buy that land but to receive the fruits of it to live? and how ſhall one receive the fruits of it but by his own Husbandry or a Farmers? So that it appears by degrees; that what courſe ſoever a man taketh in this world, at laſt he commeth to Husbandry which is the moſt common occupation amongſt men, the moſt natural and holy being commanded by the mouth of God to our Firſt Fathers. There is care and diligence requiſite in Husbandry, as there is in all the Actions of the world; and therefore as a Captain hath a Lieutenant to command his Souldiers in his abſence, or for his eaſe: So muſt you provide ſome able honeſt man to whom you will commit the execution of ſuch things, as you your ſelves cannot do without too much labour; whereof you muſt often take an account, and confer with him (as occaſion ſhall require) about your buſineſs, that nothing may be left undone for want of providence. To ſuch a man you muſt give good wages, with intent to advance your own gain, and take the more eaſe by reaſon of his honeſty and knowledge.

You will find the Improvement by Husbandry (after you have once had experience of it to be very pleaſing to you, and ſo exceeding profitable; that it will make you dili-diligent; for no man of any Art or Science (except an Alchymiſt) ever pretended ſo much gain any other way, as you ſhal ſee diſcovered and demonſtrated in this Treatiſe. The Uſurer doubles but his principal, with Intereſt upon Intereſt in ſeven years, but by this Legacy of Husbandry you ſhall learn now to do more than treble your principal in one years compaſſe. I will ſay no more of this ſubject, only it remains to tell you, that you muſt not expect either Eloquence or

Method

Method in theſe miſcellanies; but true relations and directions, plainly ſet forth, which muſt be carefully followed and obſerved: but before all things to be ſure you lay the foundation of your Husbandry, upon the bleſſing of Almighty God, continually imploring his divine aid and aſſiſtance in all your labours: for it is God that gives the Increaſe; and believing this as the Quinteſſence, and ſoul of Husbandry. *But ſeek ye firſt the Kingdom of God, and his righteouſneſs, and all theſe things ſhall be added unto you.*

An Animadvertiſement to the City and Country.

THeſe are to give publick notice to City and Country, that there is lately invented a new and very uſeful Engine, both for quencing of fire, and improving of Husbandry, it may be managed with one man to quench fire, and may be uſed 24 hours without danger of choaking, taking, up not above five or ſix foot (the whole Engine forcers and all) whereas the ordinary Engine cannot be played in leſſe than twenty foot. It is of ſo ſmall a bulk, that it may be carried through any narrow entry with two men, and is to be applied to any fire that is broken out backwardly, whereas in the ordinary Engines, they are fain to pull down the fore-part of the houſe before they can come at the fire, by

by which means the fire increaſeth much, which is prevented by this invention. It is alſo very commodious for Watring of whole Fields or Gardens, as likewiſe beating of Caterpillars off Trees. beſides ſeveral other profitable Uſes. If any ſhall deſire to have further informations or directions, concerning the foreſaid Engine, he may pleaſe to reſort to the Inventor himſelf, Mr. *Thomas Owefield*, dwelling in the Strand, near the *Savoy*, next door to the Sign of the Sun; who ſtands ingaged to the Author of the Legacy of Husbandry to make good all his Undertakings.

FINIS.